OCTOBER, 1942

Industrial FINISHING

TECHNOLOGY DEPT.
OCT 22 1942
DETROIT

This Above All

TO DO OUR PART in speeding Victory for the forces of Freedom and Democracy . . . this above all is OUR aim and purpose today.

For America's war industry we are producing finishing materials that meet specifications of both the Army and Navy.

For essential civilian needs we are producing finishing materials especially suited for this wartime emergency.

In fulfilling this double duty we pledge no compromise with the needs of our country—no slackening of our war effort.

ADVANCE PAINT COMPANY

Manufacturers of Wood & Metal Finishing Materials

INDIANAPOLIS, INDIANA

Branches at Jamestown — Chicago — High Point

. . . USE RINCONTROL

The Improved Wrinkle Finish!

THE FACT that Rincontrol assures a perfect match between parts finished before assembly is one of the reasons why so many war contractors are using this improved wrinkle finish on radio and control instruments.

This extra uniformity helps minimize the chance of error by inexperienced finishing personnel. Thus rejects due to sags, "fish eyes", fatty edges and other texture variations are reduced.

Furthermore, this one-coat finish offers extra resistance to salt spray, humidity and abrasion.

The improvements found only in Rincontrol are described in a factual product summary booklet—write for your copy today. We believe it will help you step up the quality of your wrinkle finish, and lower your costs.

ROXALIN FLEXIBLE FINISHES, INC.

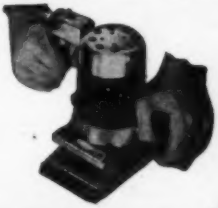
Box 102 • Elizabeth, New Jersey

ROXALIN *Flexible* FINISHES

For WAR PRODUCTION "Musts"... SPEED - PRECISION

Easy RECIPROCATING ELECTRIC SANDER

For Hundreds of Jobs



Cleaning airplane parts before welding.

Sanding, Rubbing, Polishing .... EASY Reciprocating Electric Sanders are performing indispensable three-shift duty in the production and maintenance of wood, metal, plastic, composition . . airplanes, parts, gliders, propellers, guns, searchlights . . polishing alloy dies, and hundreds of other applications . . with savings of 50% to 75% in time, labor and abrasives.

MAIL TODAY

the attached postcard for information on how to

SAVE DOLLARS
SPEED WAR PRODUCTION
THE "EASY" WAY

Finishing plastic parts.

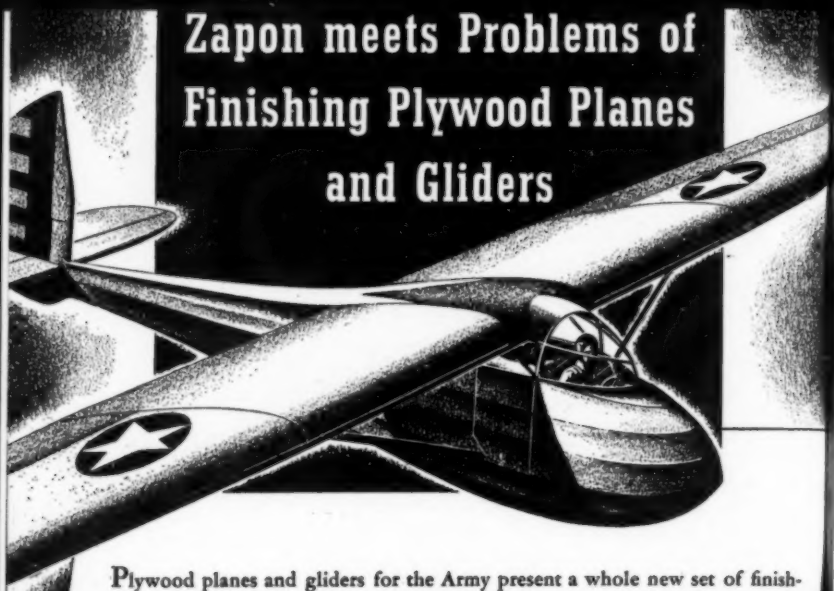
Removing pits, polishing, sanding, hi-lighting, etc., metal and wood propellers.

Cuts time 70% sanding plywood or metal airplanes and gliders.

DETROIT SURFACING MACHINE COMPANY

7434 West Davison — Detroit, Michigan

Zapon meets Problems of Finishing Plywood Planes and Gliders

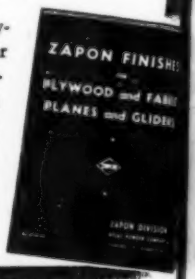


Plywood planes and gliders for the Army present a whole new set of finishing problems which must be solved not only by the finish itself, but by the application procedure. Zapon Division has developed a system for finishing these craft which meets, and in some respects exceeds, the rigid specifications for the job.

Zapon's finish provides highest moisture resistance, its sealer SX-35 going beyond the Government requirements in this respect. The system has met every test and requirement set up by Government specifications. Strength, flexibility and minimum added weight are all characteristic of this Zapon development.

Equally important is the procedure developed for applying this finish. It accomplishes two purposes. First, the components of the finish 'build up' to the ideal surface desired. Second, the finishing system fits into the high speed production requirements so necessary today.

The entire Zapon plywood plane and glider finishing system is comprehensively covered in a file size booklet which will be sent on request. New data sheets are issued as required and are easily inserted.



ZAPON

ZAPON DIVISION · ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. Western Sales: North Chicago, Ill.

INDUSTRIAL FINISHES

EIGHTEENTH YEAR OF PUBLICATION

Industrial FINISHING

Reg. U. S. Pat. Office

Published Monthly in the Interest of Modern Production Finishing

Vol. XVIII, No. 12 OCTOBER, 1942 $2.00 a Year

Contents of This Issue

Letters from Readers of Industrial Finishing ---- 4
How Douglas Airplanes Are Cleaned and Painted ---- 13
Chemical Process Gives Steel Products a Permanent Black Finish ---- 15
How We Finish Novelty Clock Cases ---- 19
Solving Painting Management Problems in a War Industry Plant ---- 23
Plastic-Bonded Plywood for Airplanes, Gliders, Boats and Trucks ---- 28
Luminous Paints ---- 37
Solving a "Cold Plate" Finishing Problem ---- 44
Silk Screen Stenciling Used Extensively ---- 55
How to Use Wood Filler ---- 58
New Materials, Supplies, Equipment ---- 68
Questions; Answers ---- 78
Editorial ---- 90
"Classified Advertising" Section ---- 103
Advertisers' Index ---- 104

R. W. Renton Joins Lea Mfg. Co. ---- 14
Frolics in the Finishing Room—12 ---- 27
Grinding—Polishing Abrasive Wheels ---- 27
Faster War-Time Spray Painting ---- 32
Not Against! Again ---- 32
Minute-Man Flag Awarded to Binks Employes ---- 42
Wartime Finishing Book ---- 42
Protects Special Hazards ---- 50
Ideas for Upping Production ---- 50
Company Changes Name ---- 56
Aluminum Industries Awarded Army-Navy E ---- 56
Foxboro Instruments Shown In New Catalog ---- 76
Painting and Drying Army Helmets ---- 80
Reclaiming Waste Synthetics ---- 82
Colors and Markets ---- 89
What "pH" Is ---- 96
Stenciling War Products ---- 98
Paint Brushes ---- 100
General Printing Ink Corp. Personnel ---- 101
Cleaning Inside Corners ---- 102
Becomes General Manager of Detroit Rex ---- 102
Airplane Spray Booth Bulletin ---- 103
Advertising ---- 104

Owned and Published by

Practical Publications, Inc., 1142 North Meridian Street, Indianapolis, Ind.

Eastern Representative: C. A. Larson, 254 West 31st Street, New York City; Phone Penna. 6-9049

Letters from Readers...

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Luminous Paint

The March 1942 issue of INDUSTRIAL FINISHING contained an article by W. J. Miskella, on the subject of blackout paint that glows in the dark. We are very much interested in the information contained therein and would appreciate it if you could put us in touch with the manufacturer, so that we may obtain prices and descriptive information.—F. P. Co.

Information supplied.—ED.

Plywood Waterproofer

On page 4 of September issue we read an article entitled "Plywood Waterproof," written by the Liquafill Mfg. Co. We would appreciate it if you would send us the address of this company so we can write them for further information.—T. C. Co.

It is 823 Richard St., Dayton, Ohio —ED.

Want to Set Up New Finishing System

We are in need of some professional services and are wondering whether you can advise us the proper firm or person that we can contact to take care of this problem?

We have gone into the manufacturing in large quantities of army and navy double-deck bunk beds. Our problem is the finishing, which requires a new finishing system. We are anxious to set up a high-production line system for the painting of these bunk beds and would like to engage the services of an industrial engineer who is thoroughly qualified in setting up a conveyorized production line for the finishing and packing of these beds. Can you give us the names and addresses of such qualified engineers? —K. N. Co.

We have suggested some.—ED.

Silk Screen Stencils

We would like to obtain a copy of May 1936 issue of INDUSTRIAL FINISHING. The item of particular interest is Part I of an article entitled, "How to Make and Use Silk Screen Stencils." If the magazine is not available, the items of interest alone will be sincerely appreciated.—L. Mfg. Co.

Copy has been sent.—ED.

Copper Plaque Problem

I have a problem which I hope you, or possibly some of your readers, can help me solve. I have made several contacts here in town, and also tried everything I could think of myself, without success.

I have an etched copper plaque, on which there is an etched photograph of a person on the upper portion, and numerous lines of lettering on the

DOLAN WAR FINISHES

for WOOD and METAL

Olive Drabs ★ **Rot Inhibiting Primers**
Lustreless Enamels **Battleship Grays**
Shell Lacquers ★ **Airplane Dopes**

If you are figuring on Government contracts with the Army, Navy, Air Corps or any branch of service—we are equipped to furnish the finishes according to Government specifications. Our staff of Laboratory Technicians is familiar with all problems and its services are available for the asking.

Also Still Available

DU-BAR BLEACH ★ **FABRI-CLEAN**
For modern light-tones **The magic Fabric Cleaner**

V. J. DOLAN & COMPANY, INC.

Mfrs. of "Unquestionable Quality" Industrial Finishes

1830 N. LARAMIE AVENUE CHICAGO, ILLINOIS

Look to Sterling for Leadership in Portable Sanders to speed production.

STERLING TOOL PRODUCTS CO.
365 East Ohio St. • Chicago, Illinois

SPECIFICATION PROTECTIVE COATINGS

With our country in the thick of the battle now, United Specification Protective Coatings are, more than ever, making substantial contributions to the war production schedule.

Yes, we are producing Government specification protective coatings under the most rigid control and standards—absolutely no guesswork, and above the approval marks in quality.

Consult United on your requirements for finishes adopted and specified by the Armed Forces. Our accumulation of experience is at your disposal—it will help you with those difficult paint problems.

Creators of distinctive industrial finishes

LACQUERS
THINNERS
ENAMELS
METALIZED FINISHES
SYNTHETICS

UNITED LACQUER MFG. CORP.
General Offices and Factory: Linden, New Jersey
New England Mfg. Division: Boston, Mass.

DRUM ROLLER

for Efficient Mixing of Materials in Suppliers' Drums

- No solvent loss
- No time loss
- Material ready when needed
- No fire hazard
- Nothing to clean
- Supplied in sizes from 5 to 110 gallons; any load, any speed.

DETAILS ON REQUEST

THE VOL-U-METER CO., 75 Wilbury Place, Buffalo, N. Y.

lower part. The plaque is 16-gauge, 16x24-in. in size. The photograph is made in halftone, the lettering in relief with the background etched down. The photograph, lettering, border, etc., are covered with the etching ground or acid-resisting emulsion, which is burned on. The background is badly tarnished and that is the problem. How can I clean the background to get an even, clean bright finish, without disturbing the ground that is on the letters, etc.?

Anyone acquainted with photographic processing of etching will readily understand what I mean by ground, acid resist or sensitizer. It will not stand polishing or any acid bright dip, to my knowledge. This is a little out of my line, and I would appreciate any help that you may have to offer.—O. C.

Will some reader please suggest something on this?—ED.

How Much in Drum

In September issue of INDUSTRIAL FINISHING, on page 22, there appears an article pertaining to measuring material in 55-gallon drums, under the heading, "How Much In Drum". We would like the name of the concern making this gauge . . .—K. Chemical Co.

The author of the article tells us that it is Pack-Rite Machine Corp., 828 N. Broadway, Milwaukee, Wisc.—ED.

"Detearing" Process

On page 84 of the September issue of INDUSTRIAL FINISHING, I see a short article regarding the "Detearing Process" of the Ransburg Co. I should greatly appreciate receiving a copy of the reprint of the article which appeared in December 1940 issue of INDUSTRIAL FINISHING magazine.—F. W. R. (Technical Director of Varnish Co.)

Copy is being sent.—ED.

Rust-Resistant Paint

One of your fairly recent issues described a product which, when painted on a rusted surface, would not only prevent further rusting, but which would combine with the rust already

SAVE LABOR TIME and MATERIAL

WITH Sans-Arb

RE-CREATIONS OF RARE WOODS

Manufacturers of products ranging from caskets and furniture to fireplace mantels, clocks, tennis racquets and toys are lowering production costs and increasing product beauty with Sans-Arb.

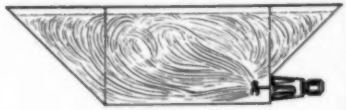
Sans-Arb can be cut to dimension and applied to virtually any smooth surfact, flat or molded. Ease of application, high drying speed and a surface equivalent of several coats of spraying lacquer (can be rubbed, sanded and top-coated) are proving important factors in war time finishing. Let a Meyercord field engineer demonstrate the real savings—and the new product beauty — possible with Sans-Arb.

Send for complete information and samples today. Address Department M

Graining Division

THE MEYERCORD CO.

5323 W. Lake St., Chicago, Ill.



Agitate Dipping Tanks with "LIGHTNIN" MIXERS

Here is a way to get dipped finishes that will be certain to meet Army specifications and pass inspection. Use *"LIGHTNIN"* Mixers on your dipping tanks.

This mixer will prevent the settling of heavily pigmented, thin paints so that uniform coating can be constantly maintained.

If mixing or agitation is one of your problems, consult Mixing Equipment Co., Inc., whose mixing experience is yours for the asking.

Note on Priorities: All offerings and specifications are subject to such government regulations as may be announced from time to time in connection with critical materials. Immediate shipment on many models and parts.

MIXING EQUIPMENT COMPANY, INC.

1027 GARSON AVENUE • ROCHESTER, N.Y.

there to form a stable composition. Kindly let us know, if possible, the name of this product and where it can be purchased?—U. R. Co.

Several manufacturers can supply a paint of this kind. We are sending you the names of a few.—ED.

"Tumbler or Whizzer"

We are interested in obtaining information regarding practical methods of lacquering bottle caps by "tumbler or whizzer" methods.—Nehi Beverage Co.

We have sent this company some information on this, but would like to get more from informed readers, on the subject.—ED.

Tumble Finishing

We would appreciate a copy of the article on "Tumble Finishing" which appeared in your September 1941 issue of INDUSTRIAL FINISHING.—C. C. Co.

A reprint of the entire article in two issues (Sept. and Oct.) is being sent you.—ED.

Reclaiming Waste Lacquer

On page 76 of your August 1942 issue, there was an article on reclaiming waste lacquer, written by Mr. W. A. Beacham. We would greatly appreciate your sending us Mr. Beacham's address so that we may contact him.—G. T. Co. (Finish Mfr.).

Wood Dust

We are running some experiments in our research laboratories that require the use of two or three pounds of wood dust, and have been advised that you could tell us about a source of supply. Will you please be so kind as to forward us this information by return mail?—J. X. Co. (Finish Mfr.).

Information supplied.—ED.

"Photo" Finishes

In your June issue, page 7, you quote an inquiry from The Furniture

(Continued on page 103)

UNCONQUERED

...A quarter of a million men under General Mikhailovitch are fighting in the mountains of Jugo-Slavia—attacking from ambush—cutting supply lines—resisting the invader at every step.

Jugo-Slavia, overrun by the Nazi armies, remains unconquered! This is the spirit of the United Nations. It will win.

STILLE-YOUNG CORPORATION

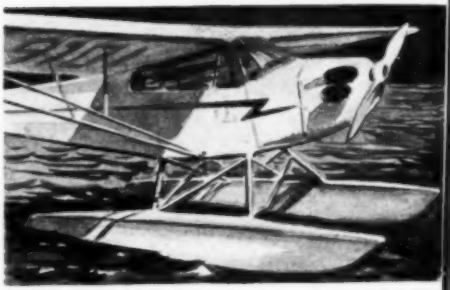
MANUFACTURERS · CHICAGO

[QUERS · FILLERS · STAINS · ENAMELS · PAINTS

Lilly Plastic Finishes fo

have been Flight Tested on

☆ Lilly Products have been tested on Plywood ships in actual flight and exposed to all kinds of weather for over two full seasons. A T C'd on Wollam Plastic Bonded Floats — Elwood, Indiana — the first built in America.



UNDER CONTRACT TO THE U.S. AIR CORPS

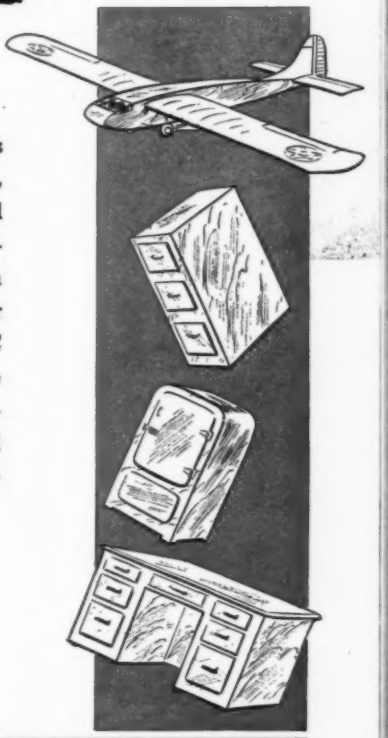
☆ The Culver Aircraft Corporation (under contract to the U. S. Air Corps) has adopted LILLY FINISHES for Plywood planes.

THE LILLY COMPANY

HIGH POINT, N. C.

PLYWOOD

...and Time Tested...



Lilly Finishes for Plywood Products such as airplanes, gliders, cabinets, desks, refrigerators, etc., are backed by years of experience in making finishes for wood. If you need a finish (either clear or pigmented) for your Plywood Product, try LILLY PLASTIC FINISHES. The facilities of three plants are at your disposal: Indianapolis, Indiana; High Point, N. C.; and Gardner, Mass.—get in touch with the one nearest you.

LILLY VARNISH COMPANY
INDIANAPOLIS. IND.

How Douglas Airplanes

BY JAMES NELSON
Plant Engineer
Douglas Aircraft Co., Inc.

Spraying a surface which is masked to form the familiar emblem of our U. S. Army Air Force on the side of a Douglas Aircraft Company airplane.

STREAMLINED methods of cleaning and washing, preparatory to the application of finish coatings, have been adopted extensively at the Long Beach, California plant of Douglas Aircraft Company.

A "progressive wash" system is utilized. This includes a mechanized conveyor transportation of parts from stage to stage. It provides several advantages. For example: great time saving, minimized damage to parts, increased personnel protection from burns or hazards, and more positive control of greater parts volume.

To provide an adequate pre-paint preparation for all aluminum metallic surfaces, the following phases are accomplished in the "progressive wash" process:

a) Tank No. 1 contains a degreasing solvent which removes surplus petroleum protectors covering the metal.

b) Tank No. 2 furnishes an alkalized hot-solution rinse.

c) Tank No. 3, a dip hot-water rinse.

d) Tank No. 4, an alkaline cleaner.

e) Tank No. 5, additional hot-water dip rinse.

f) Tank No. 6, chromic-acid etching dip.

g) Tank No. 7, hot-water rinse dip.

h) The cleaned surfaces are then dried by circulated hot air.

Note: Loaded racks are moved by a power-operated overhead traveling crane.

The process just outlined is used in the handling of all raw aluminum stock. For sheet stock, however, a separate method is utilized which cleans, primes and dries in a continuous machine. All Alclad sheet stock, which is coated with a layer of soft pure aluminum, requires a protective shop coating

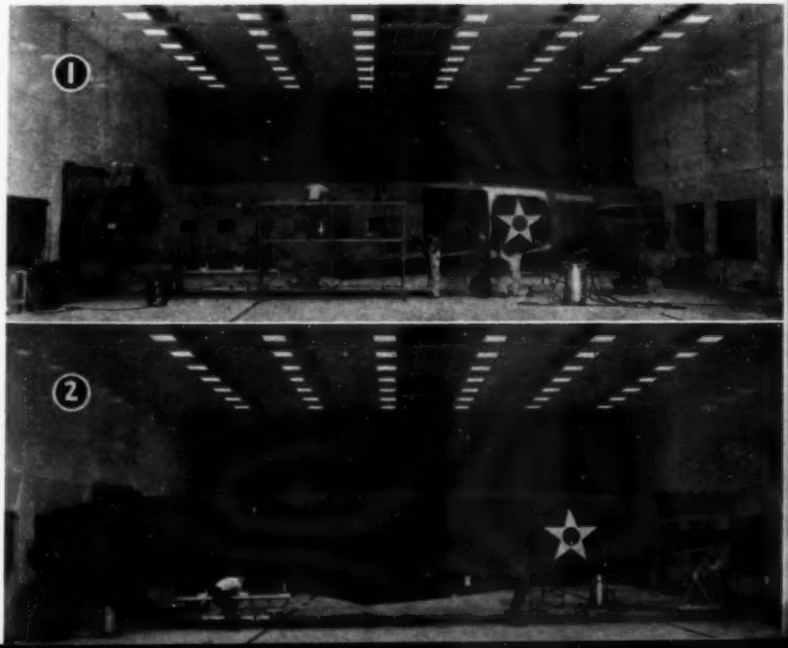
Are Cleaned and Painted

during fabrication to guard against scratches and damage. In the past, hand painting, although wasteful, was regarded as necessary to provide the shop coat. Recently, however, the adoption of a roller coating machine provides greatly increased efficiency. It applies the zinc-chromate-base darkened-aluminized shop coating mechanically in much the same manner as printers' ink is applied to newsprint.

A continuous-feed moving-belt machine takes the stock directly from the receiving department bins, passes the sheets through a cleaning and etching solution, water rinse, air drying station and across rollers where the prime coat is applied. An air dryer completes the process and the sheets can be handled and stored directly from the end of the machine. The machine handles a sheet from end to end in about one-half minute, and will take stock of any length to a maximum thickness of ¼-in., and a maximum width of 48-in. The average size of stock used at Douglas is 48x144-in.

The prime coat or shop coat application is seldom stripped. On exterior surfaces it can be covered directly with the camouflage paint

Fig. 1—How fuselage looked as sprayers started work. Notice workman masking emblem.
Fig. 2—Workmen are now moving completely painted fuselage from the giant spray booth.



used on all military aircraft. No further priming or painting is applied after the shop coat, until the camouflage coat is utilized.

Anodizing on military aircraft has been reduced to a basic minimum, as a means of furthering mass-production and time economy. However, the lower half of rigid tank shells are anodized, as well as all tank castings. Aluminum or aluminum alloy castings and forgings with male taper thread are also given anodic treatment, as well as interior valve and hydraulic members subject to wear. In accordance with Douglas practice of long standing, all rivets of heat treatable alloys, such as 17S and A17S, are given the chromic acid or sulphuric acid anodic treatment. Aluminum and aluminum alloy parts in the steam-heating systems are also anodized.

Treatment for Alumihum, Magnesium, Fabrics

"Alrok", a patented process developed by the Aluminum Co. of America, is used to provide a corrosion-resistant covering for such typical parts as extrusions. Resembling yellow alumilite in appearance, the process is a hot-dip sodium dichromate method. On one model manufactured by Douglas, all non-alclad aluminum parts will be given the "Alrok" process.

All parts to be primed, but not going through the roller coater, are chromic-acid dipped prior to painting. This is also done after the parts receive preliminary fabrication.

All magnesium sheets, castings and extrusions are given the customary Dow treatment No. 7 to provide a corrosion-proof surface.

Cloth fabric covering fabric control surface, machine-gun blast tubes, and all other fabric parts and surfaces are given hand-brushed coats of semi-pigmented nitrate dope, followed by an application of camouflage dope.

All exterior surfaces of the aircraft, including radio antennae, are camouflage painted.

Paint booth layouts are arranged to eliminate any backtracking of parts, and a decentralized booth system has been inaugurated successfully. This is contrary to the old industrial method of a centralized paint department, but it has been demonstrated that strategic spotting of paint booths and painting of sub-assemblies prior to installation has increased efficiency considerably, as well as removing hazardous painting and spraying in final assembly stages. Paint booths are sufficiently large to accomodate entire wing and fuselage sub-assemblies for complete exterior camouflage.

There is plenty to know about paint spraying before satisfactory war-time efficiency is reached. The waste of which a careless or untutored operator may be guilty is realizable in the fact that a modern spray gun, opened wide, is capable of using $10 worth of paint an hour!

R. W. Renton Joins Lea Mfg. Co.

Robert W. Renton has become affiliated with the Lea Mfg. Co., of Waterbury, Conn., to work as Field Consultant in the furtherance of the use of Lea Compound and allied products for burring and polishing in the war industries. The Lea method of burring is known widely throughout the metal industries and its use is particularly effective on ordnance parts, motor parts and aviation accessories.

Mr. Renton has represented a metal-cleaning manufacturer for several years in the Ohio area and his efforts in his new connection will be in the middle west, chiefly in the state of Ohio.

CHEMICAL PROCESS GIVES STEEL PRODUCTS A

Permanent Black Finish

BY F. A. WESTBROOK

THE Worcester Pressed Steel Co. of Worcester, Mass., which I visited recently is doing 100% war work, 168 hours a week. Included in the company's output are 100,000 items per month that must have a smooth waterproof blue-black finish. This finish is applied by a hot chemical solution process. Since government inspection is very strict, the work must be of high quality. Metal surfaces must be smooth and the finish must be practically perfect. Frequent rejections by inspectors would prove costly and would interfere with the company's volume production program. How the finish department is set up for carrying on such exacting work is of interest.

One of the several products being manufactured is a box-like type of magazine for sub-machine guns. This magazine is made from high quality cold-rolled strip steel of suitable grade, temper and thickness to make stampings without wrinkling. It has a bright finish and is free from surface imperfections.

Any burrs that appear on the edges of stampings are removed by wire brushing, filing or grinding. Burrs on the edges of holes are taken off by a power countersinking operation.

The conventional setup for the hot chemical solution process of applying the penetrating smooth black rustproof finish includes five or six or seven tanks in a row, with a traveling hoist operating along a monorail overhead. A loading table is usually needed at the starting end and an unloading table is positioned at the end of the line of tanks where the work is completed. One or more ventilator hoods and exhaust fans can be placed above the tanks to remove undesirable fumes and vapor.

Tank No. 1 contains a hot alkali solution for cleaning the metal. This cleaning solution is heated and kept at a temperature of 180° F. by steam coils within the tank.

Tank No. 2 is a hot water rinse, also 180° F., but it is heated with an open steam pipe.

Tank No. 3 contains the chemical salt solution that blackens the surfaces of the metal without adding a thickness of film that could peel off or any thickness that might increase the dimensions of the article.

At this plant the chemical solution is prepared in the proportion of 8-lbs. of chemical salt to three quarts of water. This quantity makes one gallon of solution. The tank containing the blackening solution is a gas-fired tank and its contents are maintained at boiling temperature which, for this particular chemical solution, is close to 300° F. The top surface of the

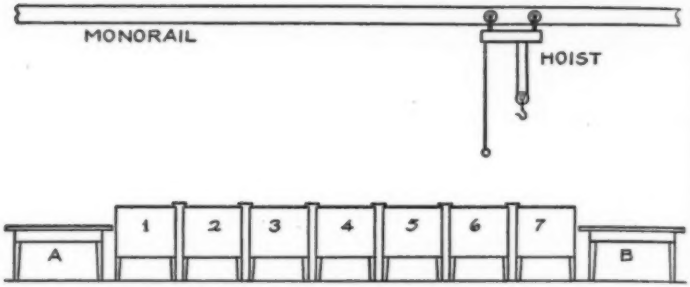


Diagram of equipment set up for cleaning and finishing pressed steel war products. Tables at each end of the row of tanks are for loading and unloading racks or baskets of items to be cleaned and finished. Contents of tanks are as follows:
1—Hot alkali cleaning solution.
2—Hot water rinse.
3—Chemical processing solution.
4—Chemical processing solution. (Two tanks double production).
5—Cold water rinse.
6—Hot water rinse.
7—Hot oil and water mixture.

solution is kept at least 6-in. below the top edge of the tank so that the surging of the boiling liquid will not cause it to overflow.

Tank No. 4 is a cold-water rinse.

Tank No. 5 is a hot-water rinse for boiling out and removing any excess salt that might accumulate in inside corners, joints, seams, etc. The water in this tank is heated with an open steam pipe. This tank is not used in all installations.

Tank No. 6 (sometimes omitted from some installations) is called the soluble-oil finishing tank. The contents of this tank are prepared in the proportion of eight parts of water to one of oil. The tank is heated by steam coils. Articles being processed are immersed in this tank for three to five minutes.

The length of time articles are left in the alkali cleaning tank depends upon how soiled the metal surfaces are and what type of material is on them. At this particular establishment, the pressed steel articles are fairly clean, and a period of three minutes in the cleaning solution is sufficient to clean them satisfactorily for finishing.

The period of immersion in the chemical processing solution depends upon how deep the penetration of black is to be in the surface of the steel. Here they are left in the processing tank for about 15 minutes.

The black finish produced by this hot chemical treating process is rust-resistant and durable for outside service. At this plant the articles to be treated are placed in special racks, but where other conditions make it possible or desirable, the items could be placed in baskets or strung on wires.

Naturally, with the contents of the processing tank boiling continually, some of the water is always evaporating, therefore more water must be added from time to time. This addition of water to the solution is taken care of automatically, as needed.

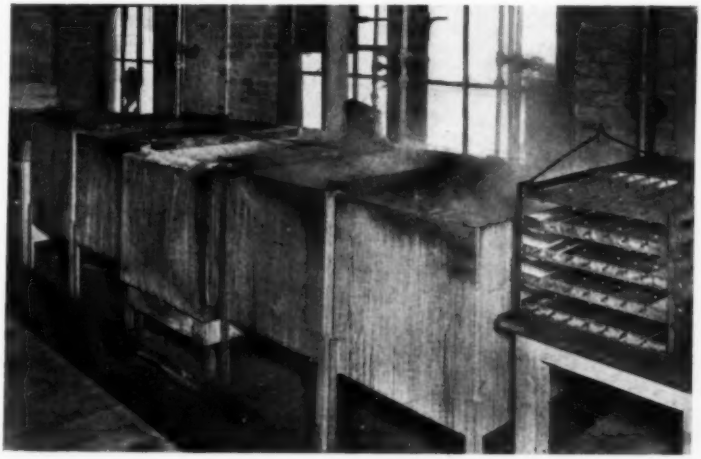
The accompanying diagram shows the layout of finishing equipment at the plant in question. You will notice that there are two chemical processing tanks here (tanks 3 and 4). This is a matter of special interest. Originally there was

only one of these tanks, as is customary in the usual set-up. However in this particular case, production requirements increased to a point where the initial installation could not handle it. Accordingly, the extra tank was added to take care of the situation. Actually, this added tank made it possible to double production on the same line, since the articles are left in the process tank more than twice as long as they remain in any of the other tanks.

Heat is applied to the processing tanks by three gas burners under each tank. All three burners are used to bring the bath up to heat; then one of them is turned out entirely and the other two are reduced to about 50%. Facilities are available which make it possible to maintain the proper temperature automatically by means of automatic indicating thermometers on each of the two tanks. The controls are arranged to operate motorized valves in separate water lines to each tank, so that any rise in temperature will automatically open the valves and allow water to run into the processing solution to replace what has been lost by evaporation, and thereby maintain a uniform solution.

The mechanical handling equipment, which includes a traveling hoist operating under an overhead monorail line, greatly facilitates the work and makes it possible for two men to take care of the cleaning, rinsing and finishing operations. They treat seven racks of articles per hour.

The workmen wear goggles and rubberized gloves while handling the chemical salt and while working around the hot baths. Particular care is exercised in following to the letter, all instructions for the correct operation of the process. For example, nothing made of copper, brass or galvanized metal is allowed to get into any of the tanks.



Typical set-up showing a row of tanks and a rack for carrying parts to be processed.

How We Finish Novelty

WE FINISH more than 3000 clock cases each week. These cases are made up in over 30 different styles. Most of them are carved pieces in a dozen or more kinds of woods. Sometimes three or more types of wood are used on one case.

The first operation in the finishing room—after the cases have been drilled to take the different decorations and have been racked on 6-tier trucks we designed and built for them—is at the spray staining booth. We have tried various types of stains and have decided in favor of the non-grain-raising type because of the greater speed at which the operator can stain a given number of pieces. This type of stain also gives a uniform coloring on the end grain and is practically fade-proof—a quality we must have because our product is displayed under different lighting conditions in the jewelry and furniture store windows all over the country.

Non-fading and uniformity are difficult qualities to secure with oil or pigment stains, which also must be wiped. This, of course, means more labor in addition to a fire hazard that could result from some careless employe leaving one of the wiping cloths lay after the day's work is over. Water stain was rejected because of its slowness in drying and the surface fuzz it caused—although we are aware of the light-fast quality of this stain.

The sprayer works from a gravity bucket. This has proved to be satisfactory for us, after a number of other methods were tried. The cup gun, with a quart cup attached, proved to be tiresome for use all day long; and with the pressure tank we did not get the same shade each time, as we could only use 2-lbs. of pressure on the material. Sometimes this pressure would vary from 4-lbs. to 1-lb., which resulted in different shades of color. The change of pressure results from letting the air out of

Clock Cases

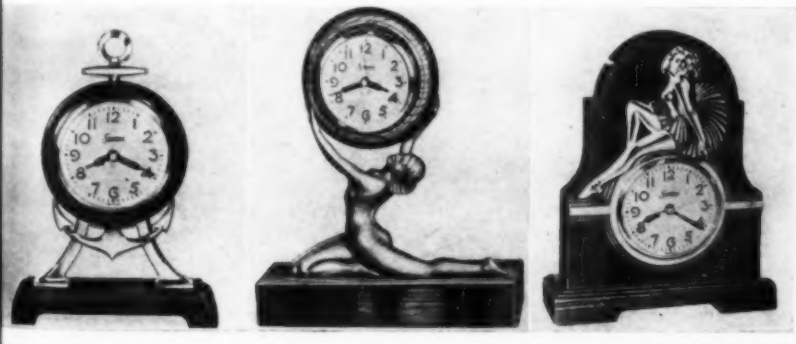
BY EDWIN HOGSTROM
Supt. Wood Finishing Division
Mastercrafters Mfg. Co.

the tank for refilling and not getting the gauge set exactly as before. An air pressure of 35-lbs. is required in spraying the N. G. R. stain.

After the staining operation has been completed the truck load of cases goes to the sealer booth, although the stain booth is so rigged up that if the need arises it can be used for any one of four different kinds of lacquer.

Our System of Lacquer Distribution

At this point I would like to describe our system of lacquer distribution. We have two large pressure tanks and two circulating pressure pumps that operate directly from the manufacturer's drums. The pressure tanks contain: 1) a satin finish lacquer used only as a top or finish coat, and 2) a colored or tinted lacquer for use on carved and turned pieces as a second coat to uniform the color. We mix this tinting lacquer ourselves, using 1½ quarts of shading lacquer to five gallons of regu-



lar gloss lacquer. Each of these pressure tanks serves all of our booths. One circulating pressure pump distributes lacquer sealer and the other one pumps gloss lacquer. This gloss lacquer is used for the intermediate coats on the cases. Each of these pumps serves all booths.

There are four valves at each station. The operator selects the one he wants to use and leaves all others closed. To switch from one material to another he releases the pressure from the one he is using and blows back the material. Then he closes the valve, and opens the valve on the new material he wants. A new operator learns the operation of the valves in a few hours.

This system saves hundreds of dollars worth of pressure equipment alone and lets us have a central paint-distribution section that can be kept clean, instead of having a lot of hose and tanks in the way of a sprayer, all around his booth. This method also allows the foreman to watch the filling of the tanks more closely, so that he can see that every bit of lacquer is strained before being poured into the tanks. It is surprising at the amount of dirt and foreign matter the strainer collects.

The clock cases are then sealed and the truck load is pushed aside to dry. We allow a minimum of two hours drying time for the sealer.

Sanding Sealer Coat; Second and Third Coats

We have on hand at all times extra spray guns in 100% working order. This is to replace any of the spray guns that begin to show signs of an uneven pattern spray. No spray booth is ever shut down for more time than it takes to connect a new gun on the line.

We are now ready for the sanding bench. We use a No. 3/0 flint paper. We have tried garnet paper and a lot of other kinds of sandpaper which are left by salesmen, but if the man using the paper does not take advantage of its long life and only uses a part of its cutting life before taking a fresh piece, there is no saving in buying the more expensive garnet paper in preference to the cheaper flint paper. After giving the case a good sanding the resulting powder from the sanded sealer is wiped off and the cases are ready for the second coat.

We use a clear gloss lacquer for the second coat. We find that by using a clear gloss lacquer as a second coat we get a better build of film and the finish will take hard knocks without turning white, as was the case when a satin finish lacquer was used for all coats over the sealer. This coat dries for four hours and is again coated with the same material. Then it is left to dry for another four hours.

Wet Sanding With Naphtha-Oil Combination

At this point the procedure varies with the type of case and the selling cost of the finished product. On the cheaper items the third coat is a satin sheen lacquer and is the last coat we give it. On most pieces though, after the third coat is dry the cases go back to the sanding bench to be wet sanded with either a No. 240 or No. 280 wet sandpaper. The case is sanded until all the gloss is gone from the lacquer coat and the surface is as smooth as glass. The wet sanding medium is either mineral spirits or a light naphtha, with 1½ quarts of paraffin oil added to five gallons of naphtha. After wet sanding the cases are allowed

to dry for about two hours to let any naphtha evaporate that remains in the hard-to-wipe places of the case. If this is not done the lacquer will turn white at any spot where naphtha remains.

The case is now ready for the last coat of satin finish lacquer, which is made especially slow so that we can get an exceptionally good flow. This lacquer levels out to a beautiful rubbed-effect sheen. After drying a sufficient length of time it goes to the assembly line and then to the packing and shipping room.

Finishing Procedure on Heavily Carved Pieces

Of course, we have a number of items that require special treatment such as the heavy carved pieces. They are treated the same up to where the sealer coat is sanded. Then they are dipped in a walnut glaze and wiped. We leave the walnut glaze in the carving but wipe the highlights. The glaze dries overnight and then goes through the regular procedure—second coat clear (or on some, a color coat) and third coat clear. Here we use a flat lacquer, instead of satin finish lacquer as the top coat.

On our solid walnut and walnut veneer cases we sap stain all streaks with a spray gun before filling. The filler used is a 4-hour type. We use what is known to the petroleum companies as "lacquer diluent" to reduce the filler. This material cuts the filler perfectly and snaps out of the wet filler very fast. Drying takes minutes instead of hours, although we allow it to dry as long as we possibly can in line with our finishing schedule.

When the filler is dry the walnut pieces follow the same procedure as the others, with the exception of the carved walnut cases. They are not wet-sanded because of the naphtha that would remain in the carvings. These pieces are given a coat of dead flat lacquer in place of the high gloss for the third coat. When this dries, instead of wet sanding, we use a No. 360 paper and dry-sand the flat lacquer.

The flat lacquer acts the same as a sealer in the sanding properties but it is a much smoother product. The powder from sanding is blown off at the spray booth and a coat of what is known as flow-coater, or gloss thinner, is applied. We mix up our own, using two gallons of satin finish lacquer, 2½ gallons of thinner and ½ gallon of lacquer retarder. This about completes our finishing schedule except for a few special pieces that require still other treatment—the same as in the finishing room of any other plant.

How Patching and Repairing Methods Were Improved

Up until a month ago we were patching after the dry-sanding operation and using regular shellac sticks. We were getting too many rejects. We now patch after the first coat of clear lacquer and use a lacquer stick that is not affected by the following coats, as were the shellac sticks. By patching at this time we save the cost of a full time inspector, and the rejects are only a fraction of what they were before. It seems that the patchers did not see all the dents and damaged places due to the dull effect of the sanded sealer, and because of the sealer powder that remained on the case when it was given to them. When the case is coated with a clear lacquer the places that require patching show up more clearly and the very small defects, on which some of the

patchers would spend considerable time, can be filled up entirely. We do not have as much patching as before and we do a better job now.

Lacquer and Substitutes That Are Now Available

Regarding the lacquer that is being supplied today—although at this writing it appears that the jitters are over—I still have some lacquer that was shipped to us when the scare was on and all the lacquer companies were making substitutes to replace the real stuff. Well the substitutes were not so hot and most of them had to be sent back or modified.

Of course, we realize that with priorities and such, the lacquer companies have to substitute something or other in their formulas, but there are some companies who are taking advantage of the situation. When this war is all over they and not the company that notified their customers of any change in the production of the material furnished, will be out.

I believe that a lacquer manufacturer who will tell his customer that something is substituted in his product and that he will stand behind the new material is protecting his future business. Any foreman who knows materials and works with his men will notice the working qualities of any new batch of lacquer, as compared to the previous lot. The new lacquer will have to be used differently—different air pressure at the tank and if it is heavier (and it usually is because undoubtedly the ¼-second and ½-second cotton now allotted to manufacturers is only a part of last year's requirements, and a substitution has to be made of many gums and of the higher viscosity cottons) that invariably increases the viscosity. Different air pressures have to be used so as to break up the material easily.

Differences in the Working Qualities of New Materials

The change of color of most all flat lacquers is probably accounted for by the shortage of zinc stearate and aluminum stearate, but the use of calcium stearate to flatten down the film is satisfactory so long as the working qualities are not affected, although the clearness of film seems to be the same. The sanding qualities of some of the sealers furnished are not as good as before, and their drying time has been lengthened. This is probably due to the solvent situation that changes from day to day. The sanding is harder because of different gums and the replacement of some of the cotton with film scrap. This will give you a higher viscosity but will lower the solids and make a surface that does not powder as easily as before.

It remains for the finishing foreman to watch his materials closely and bide the time until we get good materials back again or perhaps something far superior, which will probably result from all the research being done today to furnish the trade with a good finish from the raw materials available at this time.

The temperature of paint being sprayed should be close to 78° F. The wrong temperature for finishing materials often causes a decided increase in the cost of materials per unit finished. This kind of waste is doubly costly when the watchword of industry is conservation, and is absolutely unnecessary when temperatures are so easily regulated and maintained.

SOLVING PAINTING MANAGEMENT PROBLEMS

In a War Industry Plant

Another of Red Sparks' stories wherein he relates more unusual experiences in managing his finishing department in the face of many difficulties including priorities, shortages of stock, lack of certain equipment and demands for greater production of war materiel.

BY RED SPARKS

☆

MY DEPARTMENT'S production line zigzags up and down with as many angles as a streak of lightning. For a few days it will run way up high. We will be busy as the very devil and work will pile up so that we have more than we can get out. All of the higher-ups will be pushing me until it taxes me to keep level-headed.

Then all at once we begin to get the best of the situation and the line starts down. Pretty soon we hit the bottom and we go home that evening with everything done and nothing left to start on in the morning. New work suddenly comes in and we have to devise ways and means to meet the accelerated production. Then priorities tie us up and we slide down again.

You can do a whale of a lot when work piles up. If you are a good manager you will figure out this and that to meet the demand. What you figure out temporarily may not be strictly according to all the rules and regulations, but it will be some way to get the work done—and done properly.

When we're in war you can't lean over backward in order to obey all the restrictions put on workers in a finishing room. You might obey all the rules and fail to get the work done. Meanwhile the enemy whacks you a serious blow below the belt and knocks you out. Blows below the belt are not according to Queensberry Rules, but dammit we don't fight wars according to "them rules." You must take off your kid gloves and get your hands dirty—in this war business.

More Steel to Paint But No Spray Booth

A few days ago I had one of these difficult high points to get over. There was a lot of steel to be spray painted—much more than the capacity of the spray booths at my disposal. The situation was

one that would not warrant the installation of more equipment even if there had been time to install it, which there wasn't. What was lacking was a spray booth. This was war work and it was needed immediately.

I looked at the pile of plates that was growing higher by the hour. I determined that those plates were going to be painted, even in the face of fire and explosion hazards, insurance rules and all the other things a finisher has to keep in mind. I wasn't forgetting them but I sure was remembering that those plates were needed for United States Army Ordnance and needed in a hurry.

"George," I said to one of my spray men. "We must spray those plates today."

"Sure, boss, but we gotta no spray booth. How we gonna spray?"

"I'll show you," I said. "You hook up your outfit to the air line close to that window there." I pointed to a window opening on the east side of the paint room. "And fill your tank with zinc primer. I'll be back in a few minutes." I turned and went to my office; sat down and rang a number on our auto call.

"This you, Bill?" I said, when I heard a voice over the wire. "This is Red Sparks. Say, I've got to have two exhaust fans right away. Can you get 'em for me?"

"W-e-l-l, what do you want them for?"

"I want to improvise a spray booth, Bill."

"A spray booth?"

"Sure. I've got a lot of plates to spray and no booth to spray 'em in. I want you to mount those two fans in a window so they'll exhaust out the lower sash of the opening."

"But that kind of a set-up won't meet the code requirements, Red."

"I know, Bill. Neither did that sneak attack on Pearl Harbor meet the code."

"You'll get into trouble."

"Maybe, but I'll have the work done then. They can't shoot me or something, can they?"

"No, they can't shoot you, but it's a risk; I wouldn't do it."

"Listen, Bill. You put those fans up for me and I'll take all the risks. I'll give you a requisition for them so everything will be okay as far as your department is concerned. The risks will be all mine."

"Okay," Bill finally said. And so the fans were put up. Risks? I said to myself. Who ever heard of fighting a war without risks. If it means risks to get ordnance supplies to the front, then we will use a few risks right here in the paint room.

Risks and Priorities; We Use a Makeshift

The word *priorities* came to my mind again and I coupled the two words together. *Risks* and *priorities*. They are both necessary in war time. However, I was determined that what risks I took would be safe ones.

Bill came with two of his men and the fans, and in less than an hour he had them installed and running. George had hooked up his spray outfit and was ready to begin operations.

Well, I can't say just how much luck entered into that spraying operation—just how much the condition of the weather and the atmosphere had to do with it—but as I watched, everything seemed to be with us. The overspray floated out the window almost perfectly. There didn't seem to be any more escaping spray than there would have been if we had been working inside a booth.

It took two days to do that job and the fair weather held on. Note: I fish by the barometer, and I knew by the reading of that instrument that two almost perfect days were at my disposal. So after all the element of risk was, as you might say, a controlled risk.

I do not mean to imply that a good finishing foreman can take haphazard risks. What I'm trying to get across is that there come times, especially in war production, when a risk coupled with good sound judgment can be taken with reasonable safety. Remember the old saying, "Nothing risked, nothing gained." Why dammit, most of the things we know about today came about because somebody risked something.

Now a finishing foreman doesn't have to risk his life and limb, but he should have sufficient knowledge about his work to know what he can risk with fair safety.

When a Higher Priority Job Enters the Picture

Take these priorities that we have with us today. They are giving us concern. It is not only that we have concern over priorities in purchasing stock; it also follows that these priorities control the orders we work on.

It goes like this: I'm working along, right on schedule, on an A-1-J order. Everything is moving smoothly and I'm feeling fine. Suddenly in comes an A-1-A order backed up by a telegram for immediate delivery. Telegram is from somewhere that we have to keep under our hat, but whether it is from east, west, north or south, that telegram carries a punch. Maybe you have got, let's say, just four hours to get the material on the A-1-A order ready for shipment so that it can be picked up by a plane somewhere. More than likely there will be definite instructions about the packing and marking of the bundle or box you ship it in.

Well, if you have followed the articles appearing in I. F. and profited by what you read there, a situation like I mentioned just now is not going to bother you very much. You will know how to get that A-1-A order out and you won't let the A-1-J order suffer either. Management does it. Say mister, are you still just a plain foreman or are you a department manager? I hope you are a manager because if you are you will know how to handle both priorities and risks as they affect your finishing department.

When Priorities Produce a Shortage of Stock

Priorities sometimes raise hell with our production. Not that it is something that hadn't ought to be, because priorities are all right and proper. It's the method used by the Government to permit supplies to go where they are needed most. And right now it seems that the mills are working on steel for the Russians, which cuts in on our own supply. Besides all of the other things that harass a finishing foreman he is beset with the problem of keeping his force intact in the face of an unexpected shortage of stock.

Here is a typical case: One evening recently I had all of the work cleaned up and I was wondering what to give my men to do tomorrow. I was still wondering next morning as I started to work. Of course, house cleaning is always in order in any finishing department—in addition to the regular daily cleaning. I had partially decided to do a few things along that line to take care of what we had been forced to put off on ac-

count of the pressure of intensive production. This would include cleaning out exhaust ducts, removing the accumulation of paint from fan blades, etc. These things are very apt to be postponed in the face of conditions under which we are now working. You can postpone such things just so long and then you must take care of them. We started that job—and finished it in record time. Having started it, we had to finish it quickly, because the morning was only an hour old when things began to happen. That's how quickly changes take place in war work.

We had been making 30 units a day for one of our war production jobs. The unit I have in mind is heavy and difficult to handle; requires a crew of four men working together to get them painted. Our assembly line was turning out 30 completed units daily and it was up to us in the finishing room to maintain that schedule each day, on the heavy part, so that there would be no break on the line.

We found it more speedy and economical to prime 60 of them in one day and then apply the finish coat the following day, rather than to prime 30 and finish 30 on the same day. This way we saved one paint hookup. It is a job that I have difficulty keeping men working at, for those units just simply have to be man-handled and 60 of them is a very long stretch.

A Sudden Increase in Our Production Is Scheduled

Well we were about in the middle of our cleaning work when word reached me that production on that heavy part had to be increased from 60 to 80, meaning that the assembly line was increasing their daily output from 30 units to 40, and that we had to be ready to function the next day.

In one of my previous articles, I used the word *flexibility*, meaning that a foreman should have his department in such a shape that he could—well, stretch it suddenly if he had to, or make sudden changes without disturbing the smoothness of his running.

He should; but a 30% increase in production — asked for at nine o'clock in the morning and demanding full operation the next day—is pretty fast; but it was done. We finished our cleaning job and immediately began to arrange for the change. By mid-afternoon we were ready to accept 80 of the heavy units in place of 60.

It meant the rearranging of our work in nearly all of the finishing room — changing spray men and helpers from their accustomed jobs to the new set-up so that we had two 4-men groups in place of one.

We Make Changes Quickly to Take Care of Increases

We could do that here in our finishing department without any confusion whatever because the men have been trained to adjust themselves to quick changes. They have been taught to think along lines that conform to good management methods so that it was comparatively easy, once the changed plan was explained, to get the department in readiness for work next morning.

The new schedule of 40 units daily is going along smoothly, but in making this change we did something else. We provided for a further advance in production. One group of men can handle 60 units a day; and now, having two groups, it will be possible, with very little adjustment, to handle 120 per day. This means prime 120 today and finish them tomorrow—a production of 120 finished in two days, making 60 available daily.

This change was made from nine o'clock in the morning to 2:30 in the afternoon. There was no assistance from a layout man and no discussions about how to do it. It took place about like this:

The production manager came into the finishing department.

"Red," he says, "you have got to paint 80 of these heavy pieces a day instead of 60."

"When?" I asked.

"Gotta start tomorrow."

"Judas Priest!" I exploded. "Tomorrow?"

He just said, "yes sir," with an accent on the sir, and walked away smiling.

At 2:30 I reported at his office. "We're ready sir," I said. "You can deliver 80 tonight."

So, this is Red Sparks telling you that *priorities* and *risks* may give you some concern, but *management* and *flexibility* will get you across all the tough places.

Frolics in the Finishing Room—12

THE PLACE where this story originated was in a phonograph factory, some years ago. After a cabinet was coated and finished it was delivered to what was known as the oil and patching department where all cabinets were gone over and touched up. Stick shellac or stick lacquer was burned in on all bruised places on finished surfaces. The trimming of the cabinet was also completed before delivery to this department. All parts were made perfect before final inspection and placed in a shipping box for delivery to customers.

Alcohol lamps were used as heating units for heating of burning-in knives. At that time it was thought that grain alcohol had to be used in

these lamps in order to get the best results. Each operator was allowed a small portion of alcohol each day. It was rationed to him by a responsible man in the stock room every morning.

The men used their alcohol sparingly in order to have a little left over at the end of the day. The left-over was carefully poured into another container and kept until the end of the week—Friday or Saturday. Then a drinking spree would start. Workmen would begin to drink the alcohol they had saved up during the week.

Eventually the boss discovered what was going on and decided to do something about it. Finally it was stopped by switching from grain alcohol to denatured alcohol.

—F. W. WORTH

Grinding—Polishing Abrasive Wheels

A new book of 64 pages 5x7-in. shows in color a great variety of shapes and sizes in small abrasive wheels mounted on ends of spindles. Steel cutters, saws, wire brushes and buffs are also included. Small portable motors are shown for use in driving these many cutting, grinding and polishing tools. A copy of the book can be obtained free by writing Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago, Ill.

Plastic-Bonded Plywood

FOR AIRPLANES, GLIDERS, BOATS AND TRUCKS

Since plywood has become the No. 1 alternate for sheet metal in the manufacture of so many war and civilian products, even those exposed to all kinds of weather, it is necessary to use materials and methods that will protect such surfaces and give them maximum durability.

COOKING wood and plastics into any kind of shape, is a quick definition of the patented Vidal process used for forming a variety of bent shapes and products of plywood. Actually it consists of wood veneers bound together with a new low-temperature thermo-plastic material, and the whole molded and welded into the graceful curves of airplane wings, fuselages, gliders, truck bodies, furniture, boats, skis, floats, racquets, gun stocks, dock housings, caskets, girder brackets, cabinets, ducts—in fact, practically anything that was formerly made of sheet metal.

Plastic, Heat and Fluid Pressure

According to the patent description, it is a "single-operation method of molding, by means of heat and fluid pressure, plastic treated veneers which have been wrapped about a form into a completely reinforced or non-reinforced shaped structure." This sounds very simple but it represents the result of years of disappointments, the expenditure of large sums of money, and painstaking research not only by Gene Vidal and his associates, but by the laboratories of some of the leading chemical companies in America. Getting it recognized by people who had made up their minds that metal was the last word, not only in airplane design but in

Cleaning off the "cooked" fuselage before it is removed from the form, after it is taken from the tank.

BY PAUL CHRISTIAN

almost every article we use, was a tremendous job.

Since the WPB has placed restrictions on the use of metal and banned hundreds of articles formerly made of aluminum, steel, iron and tin, the whole complexion of things has changed. More large concerns have sent their engineers and production managers to the Vidal Research Corporation's laboratories, seeking ways and means of making former sheet metal articles for war and civilian uses.

A comparison of costs between products made of plywood by the Vidal process and products made of sheet metal indicates that with small quantity articles such as airplanes, boats, etc., the initial cost of the wooden forms shows a tremendous advantage for this kind of fabrication. As to costs of finished products, in some instances the cost of an article so processed is but a fraction of the light metal article. In others it may be about the same.

In the case of aircraft, the saving in the cost of a pursuit or bomber plane couldn't be a major factor since the engines, undercarriage, and numerous other parts couldn't be duplicated in plastic plywood. However, for small private planes with practically no gadgets, and much simpler in design, not only a superior plane can be built, but it costs considerably less.

Plywood is not a new item in airplane construction. In fact at the

Lifting a finished wing tip from the form.

beginning of the heavier-than-air machines, plywood and fabric glued together was the basis of manufacturing. However, with the advent of the Ford all-metal plane, the discovery of new, light alloys and the intensive work of engineers of metal producing companies, this country became metal-plane minded. The difficulty of forming plywood and the probability of faulty joints through the old methods of gluing gave aeronautical engineers the creeps whenever it was mentioned.

Foreign Countries Use Plywood Extensively

Germany, Japan, Italy and Russia, England and Canada are using wood and plastics in their planes to great advantage. The much publicized "Zero" plane the Japanese are using is wood and

fabric, as is the German Messerschmidt. It took a lot of convincing here to prove that this process would do the trick, because only men who are accustomed to working in wood understand its merits.

Early in 1937, Vidal began actually working on his "Cooking". He had probed every plywood operation in the country, traveling from coast to coast, stopping off at any point that offered a clue to new methods. The first experiments were started in the Kellett plant in Philadelphia, but the problem of wooden molds decided him to seek a wood-working factory, so he moved to Paterson, N. J. where he found what he wanted in a pattern shop. Now, the Vidal Research Corp. is located at Camden, N. J.

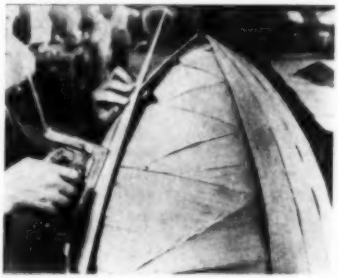
Molds Play Important Role in Forming

Molds play an important part in the operation because each article to be made must be reproduced exactly in the solid wood forms around which the plasticized veneer is eventually wrapped. This requires engineering and experience, not only because of the curves and angles involved, but because of the factor of removing the fabricated shell from the form after the cooking process.

The slotting of molds is extremely important as it is this operation that determines the placing of bracing before the skin is wrapped on. The principle of the patent is not only the curving, but the welding of reinforcing inside the structure simultaneous with its forming.

Next comes the templating. This cutting of veneer to fit without waste, together with the arrangement of the various grains of wood in the laminated layers for maximum strength also calls for "know how." In the process of cooking under fluid pressure it was necessary to protect the fabricated article from moisture; otherwise forms buckled and the plywood wrinkled and broke. Because of warping it was impossible to remove the finished impression.

In the early stages, Vidal wrapped the veneers with rubber strips, but this didn't work. Then he built



Another method of wrapping veneer on mold of a small object. All staples are withdrawn as each layer of veneer is put on. They only hold the lower layers in place until the upper layer is added.

a great rubber bag. This cracked and split as fast as heat and pressure were applied. The Du Pont Co. had been working with the organization in developing low-temperature glues, because high-temperature plastics would not do the job. Intrigued with the bag idea, Du Pont engineers developed a new membrane which not only answered the problem but which stands up under numerous cookings.

Uniform Pressure Necessary in Forming

A young engineer, Larry Marhoeffer, who is co-patentee with Vidal in the process, and who is chief engineer at the laboratory, explains the bag as "being like a

The Vidal bag after the air is drawn, showing how it hugs the object being cooked.

rubber glove. Have you ever put on a loose rubber glove and dipped your hand in hot water? As the air goes out of the top, the pressure of the water molds the glove so tightly to your fingers and hands that you can hardly draw it off. This is the principle of our bag."

Explaining the pressure idea further, he said. "The whole thing is a matter of complete pressure. Each exposed surface of the thing we are molding must have uniform pressure. We cannot use mechanical operations because too much of the energy is lost, by reason of the varying thickness of the laminated veneer. Fluid pressure is like the depths of the ocean; the deeper you go, the more complete the pressure."

Special mechanism was developed for drawing the air from the bag. The bag and its contents are wheeled into the pressure tank and the tank is sealed. Steam and air in exactly correct proportions are let in. However, both water and hot air have also been used. The pressure ranges from 20-lbs. to 50-lbs. to the square inch, depending upon the articles being made. The heat is around 240° F. This also varies with the glue. This low heat satisfied early critics of former mechanical processes who claimed that high heat destroyed the fibers of the wood because of the varying amount of water in different woods.

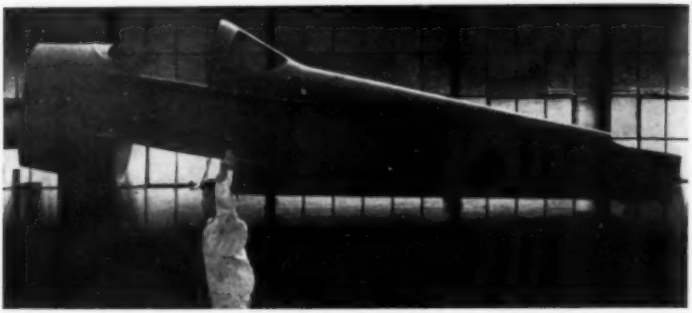
Plywood Airplanes Gaining Acceptance

The first two-motored plane molded by the Vidal method was the Langley, which created enthusiasm among aviation men. This ship was built on Long Island by men trained at the Vidal Laboratories and flown in many sections of the country.

The builders of big bombers have not yet been convinced that this type of material is as good as metal for entire ship construction, although many of them have installed some equipment for molding plywood and are playing with the idea. The answer, however, seems to have come from Canada. An Anson bomber fuselage, engineered by Vidal, which is larger than the famous Lockheed-Hudson, has been tested for ten months by Canadian pilots. . . Word comes from the north that pilots scramble for this particular ship on training flights, not only because it is faster, but because it does not have the vibration of metal planes and is warmer in winter because laminated wood is not a conductor of cold.

Canadian Government Orders Plywood Planes

The Canadian Government offered Vidal a contract for sample parts for the Anson bomber, which he passed on to a licensee, Universal Molded Products Corp. This is a Virginia furniture group that had been put together by strong financial interests. An assembly line was set up, engineers and workmen from the Vidal shop were loaned, and the work of delivery



Finished fuselage after the sides are put together. This entire fuselage weighs 72-lbs.

got under way. In fact many thousand bomber parts have already been shipped.

The Allied Aviation Corp., near Baltimore, Md., is also handling large contracts for airplane parts, working night and day and enlarging their facilities. One of their projects is the construction of a transport glider, a great bird-like structure capable of carrying 12 men and their complete equipment. Forms for this ship contain more than a carload of lumber and, lying on the platforms in the great hanger-like building, they resemble whales that have been washed up on the shore. Their dimensions are still a military secret. To cook the fuselage of this ship requires a tank 9-ft. high and 60-ft. long.

As Vidal sees the picture, the process has many possibilities. He visualizes life boats, speed boats, sail boats and steamship superstructures as a natural field for this process and material. He says: "I've always been a nut on one thing, simplicity of design. Engineers like intricate problems. I don't. I like to see things better but cheaper."

Faster War-Time Spray Painting

To speed finishing and to conserve materials, the Du Pont Co., Wilmington, Del., is conducting an educational campaign to improve the quality and increase the efficiency of spray painting. Since Du Pont to its own satisfaction demonstrated during peacetime that spraying technique generally is subject to improvement—refrigerator finishing costs for example, were gradually reduced from $2.50 per 6-cu.ft. unit to 75c largely through better painting practices—education efforts are timely under present conditions with many semi-experienced gun operators at work.

In a new free booklet entitled "Hints on Wartime Finishing Economies," eleven factors which must be under control to produce faster, more economical finishing are described. The factors essential to efficiency and conservation are: Temperature of Paint; Air and Fluid Pressures; Viscosity of Paint; Adjustment of Spray Gun; Handling of Spray Gun; Triggering of the Gun; System in the Strokes; Uniformity of Coating; Thickness of Film; Causes of Rejects; Touch-Up Procedure.

Not Against! Again

(Correction)

In Paul O. Blackmore's article about "Infra-Red Reflectance of Paints", Sept. 1942 issue, page 58, second column, eighth line from top, the word "against" should be "again", so the sentence will read: "We emphasize again the importance of absolutely uniform illumination."—Ed.

THE sea is tough on paint. Only the best is good enough to stand up in maritime service. It is significant, therefore, that Johnson's Wax-O-Namel is now being used by manufacturers of life rafts, clothes lockers, metal bunks and other equipment for the U. S. Maritime Commission.

Many shell boxes, heater and air conditioning units, soap boxes and much other equipment for the Navy are also finished with Johnson's Wax-O-Namels and Johnson's Lacquers. Air corps repair docks, heavy duty air corps jacks, too, have the protection of Johnson's Lustreless Olive Drab Enamel.

The makers of Johnson's Wax supply product finishes in great variety to meet Government specifications. To war material contractors we can promise speed in developing special finishes for tough jobs. Write Department IF-102.

S. C. JOHNSON & SON, INC. • Product Finishes Division • Racine, Wis.

PAINT SALVAGING—

AND HERE IS HOW BINKS CAN HELP YOU:

A NATIONWIDE salvage survey of the paint situation, recently completed by the Chemical and Textile Units of the W.P.B.'s Conservation Division, emphasizes that all types of paint are urgently needed in the manufacture of army and navy equipment.

On the basis of available information, it is believed that a saving of approximately 100 million pounds of essential chemicals could be realized in the next year and a half through adoption of a salvage program.

Paint salvaging consists of two steps: First, the collection of the overspray and second, chemical reclamation. Binks can help you with the first step . . . your paint supplier will help you with the second.

Binks' new Dynaprecipator Water Wash Spray Booths draw the overspray and fumes through a special, highly efficient water curtain which washes them out of the air and deposits them in the form of sludge, ready for collection and further reclamation.

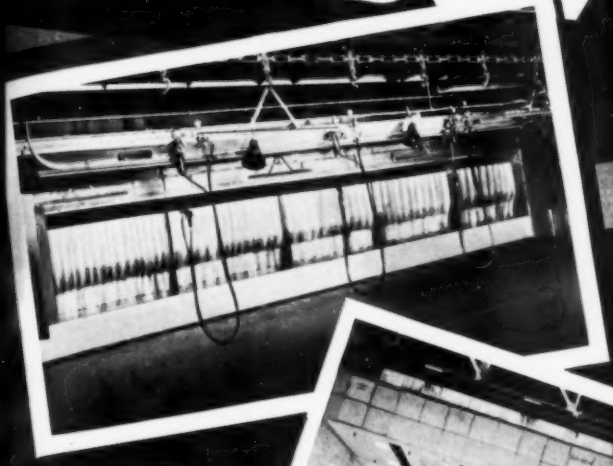
WRITE TODAY FOR COMPLETE INFORMATION ABOUT BINKS DYNAPRECIPATOR SPRAY BOOTHS. NO OBLIGATION.

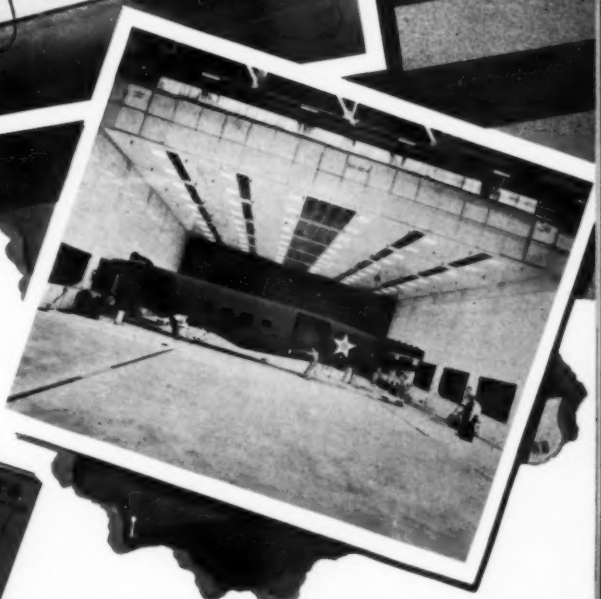
BINKS MANUFACTURING COMPANY

3114-40 CARROLL AVENUE • CHICAGO, ILLINOIS

NEW YORK · DETROIT · SAN FRANCISCO · PHILADELPHIA · PITTSBURGH · CLEVELAND · ST. LOUIS · MILWAUKEE

IS A "MUST"





Binks Dynaprecipator Spray Booths are available in all sizes. Recent improvements in design give these booths greater paint salvaging efficiency than ever.

COMPANY

CHICAGO, ILLINOIS

ND · ST · MILWAUKEE

BOSTON · LOS ANGELES · SEATTLE · WINDSOR, ONTARIO, CANADA

MAHON'S Answer to Labor Shortage . . .
in Industry's Finishing Operations
Metal Cleaning and Rust Proofing Equipment
Hydro-Filter Spray Painting and Ventilating Systems
Industrial Drying and Baking Ovens

Coordinated finishing systems

Shortage of skilled labor is the most vital problem confronting industry today—a problem that is constantly growing more acute as the demands of our fighting forces absorb additional men.

In the Finishing Departments of many war production plants, Mahon engineers have accomplished some exceptional results toward combating this labor shortage. Increased production with decreased manpower is continually being achieved by the institution of more modern finishing methods—by revision and re-arrangement of plant and production layouts—by replacing obsolete and inefficient machinery with *faster* and *better* equipment.

Your entire FINISHING problem—cleaning, rust-proofing, painting, drying and baking—can be turned over to Mahon's engineering staff with complete confidence. The Mahon organization, backed by years of research and practical experience in this highly specialized field, can be depended upon to do a thorough engineering job in the designing and building of ultra-modern Finishing Equipment. Mahon installations have established remarkable records in boosting production output—with less men—in less time—at less expense.

THE R. C. MAHON COMPANY • DETROIT • CHICAGO

Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Spray Booths, Oven, All Hydro-Filtered Air Supply Units, Hydro-Fume Dust Collectors—and Many Other Units of Special Production Equipment—including Complete Finishing Systems.

MAHON ★

Here is the article on Luminous Paint, which you requested. I regret the delay in getting it ready, which has been due in a measure to pressure of Government Defense orders.

You are at liberty to revamp the article and make such changes as you see fit. I took time out today to insure completing it. I believe it will give the industry some facts that may prove of benefit.—THE AUTHOR.

Luminous Paints

BY A. H. JACKSON
Manager & Chief Chemist
American Luminous Products Co.

LUMINOUS PAINT has moved into the foreground since the necessity for blackouts has arisen, and it is generally recognized as a valuable aid in furnishing illumination during such periods. The light radiated is of no aid to the enemy, as it is not visible for sufficient distances overhead to enable enemy planes to locate bombing objectives. However, it does serve a useful purpose in the protection of defense plants and civilians. Municipalities are illuminating street curbs, intersection markings, direction and danger signs, emergency apparatus, air-raid wardens' helmets and equipment, etc. Such a paint has numerous uses in warfare, both on land and sea. It is especially valuable on board ships, and for illuminating life boats and preservers.

The luminous pigments employed consist of specially prepared sulphides of calcium, strontium and zinc. Calcium, due to its stability and freedom from discoloration when exposed to direct sunlight, is generally preferred. The initial colors radiated in darkness immediately after exposure to light, either natural or artificial, are of but a few minutes duration, changing to a white or light yellow. They are of short wave-length and change to longer wave-length with the disappearance of the colors.

It is the light of the long wave-length that has practical applications, as it continues for many hours after the exciting light has been cut off. The pigments with the strong initial glow are apt to be lacking in strength and duration of afterglow. I refer particularly to the strontium and zinc types.

Combinations of calcium and strontium have been found to produce satisfactory results. The zinc, in particular, turns brown when subjected to direct sunlight, and the strontium forms unstable poly-sulphides with reduction of light radiation. Attempts have been made to stabilize strontium with some success. My research work started back in 1914 and included all of

these pigments. I discarded all but the calcium which I found to possess advantages over the others. The most outstanding advantage is its strength and duration of afterglow; also, a decidedly lower cost of production, the latter making it possible to produce a high quality luminous paint that could be offered at a reasonable price, permitting extensive use.

Action of luminous paints

The Paint & Varnish Industry is interested more in the formulation of a luminous paint rather than what causes it to shine, but I will dwell on this briefly. Either natural or artificial light, when thrown on a luminous pigment, causes it to shine in darkness. The action of the exciting light causes electrons to be driven away from luminous centers or phosphores, and when the light is withdrawn, and during the returning of the electrons to the centers there is a collision between them, with the resulting light radiation. The light becomes gradually less in intensity as the hours pass, more noticeable at the start, but during this period of discharge there are stretches when it is fairly constant.

A good luminous paint should have a useful afterglow of at least 12 hours from darkness to dawn. There is no advantage in having a longer light radiation, as daylight renders it indiscernible. A short period of a few seconds of light excitation is as effective as long exposure, except during the period approaching darkness. The best results are had when the exposure continues right up until darkness, the paint lighting up when the proper degree has been reached.

Luminous paint has its limitations, but within its field it is very effective. It can not compete with artificial light, and in order not to misjudge it the observer should be fully informed as to its characteristics. Light is judged by contrast. Molten iron, when poured into a Bessemer converter, has the appearance of dark coffee in a white cup, yet sunlight is more than 5000 times as bright as the dazzling radiance of the incandescent metal. The light from a single match will light up a large subterranean totally dark chamber in the Oregon caves.

Testing the Action of Luminous Paints

The light radiated from the calcium pigment is a short violet ray changing to the long white. It can not be tested for this white light in darkness during the day, as the eyes are not in night condition. If an observer emerges from a brilliantly lighted room and views a luminous surface in darkness it will at first appear dull until the eyes have accommodated themselves to darkness, after which it shines at full brilliancy. In order to get the full luminous effect the darkness should be such that ordinary white paint is invisible. The location should be well away from artificial light and strong sky reflection from large cities. In shaded locations, even on nights when the moonlight is strong, the luminous effect will be visible.

Blackout conditions are favorable for showing the advantages of the paint. An effective method of demonstration is to paint one triangular half of a piece of white cardboard (post card size) with the luminous. If light conditions are not right the card will appear in darkness as a rectangle, but if we have our space sufficiently dark the appearance will be that of a tri-

EASIER · · · FASTER
and no risk of FIRE

SAF-TE NON-BURNING REMOVER

A striking improvement, SAF-TE is actually more powerful than former inflammable removers. Non-burning, you can use it anywhere with absolute safety.

Penetrates any number of tough coats. Acts equally well on enamel, paint, varnish, shellac, lacquer and synthetics. Also effective on certain types of baked finishes. Harmless to wood, metal or any surface. *And it leaves no waxy residue—no difficult wash-up job.*

Get the facts about SAF-TE. Order it from your usual source of supply.

WILSON-IMPERIAL CO., 115 Chestnut St., Newark, N. J.

●

We have a remover for every purpose

In addition to SAF-TE, we make the well-known

LINGERWETT
—largest selling general remover in the U. S. A. Fast, economical.

WONDER-PASTE
A semi-paste remover, ideal for upright surfaces.

NO-WASH
A new remover that requires no wash-up, saving 30% of time in removing.

● **MAIL COUPON**
for facts on SAF-TE NON-BURNING REMOVER—also assistance on your removing problems.

Wilson-Imperial Company, 115 Chestnut St., Newark, N. J.
Kindly send me information on SAF-TE and other removers. I am particularly interested in a remover to be used on

.....

Name.....

Street.....

City..... State..... E-102

angle. Only that portion which is painted with the luminous paint will show.

While luminous pigments have been known for centuries, definite improvements have been made in the light-radiating properties during the past few years. The general public, as a rule, is not familiar with luminous paint and comparatively few people have seen or used it. It is therefore of the utmost importance that full information and directions be supplied to purchasers. One who is fully informed becomes an enthusiastic user. To offer the paint without such information is inviting dissatisfaction.

As an example of what should be expected from a good luminous paint, recent tests of the calcium pigment type have shown that a metal helmet painted entirely and left exposed to daylight for an hour or so before darkness, and then taken into a dark area, is visible throughout the night. Even just before daylight on the following morning, when activity has lessened considerably, it can be seen at a distance of over 25-ft.

Formulation of Material

Practical tests by the user demonstrate more accurately and truthfully the efficiency of the paint than laboratory photographic instruments used to test self-luminous radium compositions. It would seem that the human eye is more dependable than the photographic plate. From a defense standpoint it is important that the luminousity be not seen, especially from overhead, at too great a distance which might aid the enemy and defeat the purpose of its use.

Luminous surfaces can be seen at reasonable distances, depending on their area. In illuminating signs, colored lettering can be used on a luminous background or vice versa. At distances the lettering tends to shimmer together, but the light can be seen, enabling the observer to locate the sign and approach it until the lettering is legible.

In formulating a luminous paint the pigment content per gallon of the finished product should be 4½-lbs. No other pigment should be added. While the addition of inert pigment will improve the painting properties, this advantage is offset in loss of light radiation because of a covering up of the active pigment. *The light is radiated from the surface of luminous pigments,* so there is nothing gained by piling up with a heavy coat. Two thin coats give a complete mask and answer for all purposes.

The selection of a proper vehicle is of the utmost importance. It must be fairly pale and free from lead, maganese and cobalt driers. The drying action of the paint is obtained by a careful selection of the gum and by using a reasonably fast thinner. The alkyd marine varnishes, as supplied free from driers by the manufacturers, can be used to advantage. Some of these are subject to priority regulations. For non-priority orders the varnish maker is left to his own resources. Clear nitrocellulose lacquers are being employed. The lacquer type paint must be used shortly after compounding, as a jellying will occur. Such lacquers are being offered which are non-jellying.

No grinding of the pigment with the vehicle is required or recommended, as this reduces the luminous properties to a marked degree. A thorough mixing will suffice. The batch should be allowed to stand for a few hours until all gasing has ceased, after which it

Paasche TURNTABLE AIRPAINTING UNITS *Keep Turning 'Em Out!*

EVERY time the clock ticks off another hour, another big load of Paasche finished shells are turned out of the machine, pictured above. Scores of other war-time plants, too, find that they can do their finishing job faster, easier, better and more economically by using Paasche turntable units like this These machines take a minimum of floor space and maintenance, produce perfect work at top speed.

Paasche automatic turntable units are engineered and built with the same precision and have many of the advanced features of the large conveyor types. They may be just what you need to increase production in your Finishing Department. But whatever the job to be done—whether it calls for a turntable for shells or the largest conveyor to coat steel shell cases, it will pay you to investigate Paasche equipment.

Paasche engineers are ready to help you with your finishing problems—use their services to your advantage. Complete information with Bulletin F3-42 will be sent upon request without obligation.

Get the Paasche Type Cub High Production Airbrush — It's Easier to handle.

Here's the all-around gun you need for most finishing jobs. It is light weight, perfectly balanced, built to last. Has exclusive Paasche features that cut time and operational cost to the bone! Get facts in Bulletin FM8-42.

Paasche Airbrush Co.

1902 DIVERSEY PARKWAY
CHICAGO ILLINOIS

should be given a short agitation and placed in cans, preferably gallon cans for commercial use. There is more settling of pigment than is usual with ordinary paints. However it is not a hard settling, and is readily stirred up and combines with the vehicle. The pigment is coarser than the usual variety, with absorption almost nil.

Application of Luminous Paints; How Long the Paint Keeps

The luminous paint can be applied like ordinary paint. Excellent results are obtained with the silk-screen process, spraying, dipping and with hand brushing. Sheets of cardboard 20x27-in. are being illuminated by the silk-screen process and are finding many practical uses by those who are not situated to do ordinary painting. The cardboard can be cut into desired sizes and shapes.

The paint will keep in prime condition in closed containers over a long period of time if the proper vehicle is used, so there is no delayed chemical action going on which would cause deterioration. The paint will retain its active life out doors as long as the vehicle protects the pigment from moist air. Tests have shown that the alkyd varnishes give the paint exceptional weathering properties under severe climatic conditions, over a year. This life is lengthened if a finishing coat of the varnish is applied.

It is the practice to apply a base coat of white pigment paint free from lead. This is imperative over old lead painted surfaces.

Various finely ground color pigments can be added sparingly to produce pastel shades to give contrast in sign painting. Deep coloring will reduce the light radiation of luminous paint.

Minute-Man Flag Awarded to Binks Employes

In an impressive ceremony recently, the employes of the Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., were awarded the coveted Minute-Man Flag

Happy and proud to win Minute-Man flag.

by the U. S. Treasury Department. The presentation took place on the roof of the plant, where many of the employes gathered to see and hear the ceremony. Others heard it through the plant's announcing system.

Mr. J. F. Roche, President of the company, acted as Master of Ceremonies. The speaker of the day was Mr. J. G. Gallaher of the United States Treasury Department War Savings Staff. After the flag was awarded, Mr. Roche presented an attractive Honor Roll to the employes, listing their former fellow workers who are now in the armed forces.

Candid camera shots recorded the entire ceremony. Selected pictures were then printed in the interesting booklet and presented to all the employes who made it possible for Binks to proudly fly the Minute-Man Flag.

The entire capacity of the Binks Mfg. Co. is devoted to the production of spray-painting equipment for war industries. In signing up for the Treasury Department's payroll deduction plan, the employes were showing once more that they are out 100% for victory, in spirit, in dollars, and in production.

Wartime Finishing Book

Both the right and the wrong methods of doing many things in the finishing room are illustrated and described in a new free 16-page book entitled, "Hints on Wartime Finishing Economies", published by the Finishes Division of E. I. Du Pont de Nemours & Co., Inc., Wilmington, Dela.

When he shelved his hat for a helmet

we were ready

A few of the many war products finished with Murphy Protective Coatings

- Airplanes
- Ammunition
- Commando ramps
- Communication sets
- Gas masks
- Gliders
- Optical apparatus
- Plywood assemblies
- Range finders
- Ration cans
- Searchlights
- Ship fittings
- Trucks
- X-Ray equipment

Some idea of the great variety of war equipment being finished with Murphy Protective Coatings is conveyed by the list at the left.

We were ready when the call came because we had been serving industry's varied finishing needs for more than 75 years.

This vast background of experience, combined with the knowledge we have gained in current war work, makes us unusually fitted to provide you with the *right* protective coating—a finish that will not only meet government standards, but will also be keyed to *your production methods.*

Experienced executives say

"PUT IT UP TO MURPHY"

Phone or write our nearest office

MURPHY VARNISH COMPANY

NEWARK SAN FRANCISCO CHICAGO

MURPHY

PROTECTIVE COATINGS

Solving a "Cold Plate" Finishing Problem

BY H. H. SLAWSON

INFRA-RED baking has come to the aid of Dole Refrigerating Co., of Chicago, in helping to solve a finishing problem created by the World War.

Since their introduction some 15 years ago, Dole vacuum cold plates have won outstanding success in providing maximum refrigerating efficiency for perishable food products. These plates are found today supplying the refrigeration for motor trucks, ice cream cabinets, soda fountains, back bars, liquid coolers, food counters, salad plates, display cases and windows, frozen-food locker plants, and other places.

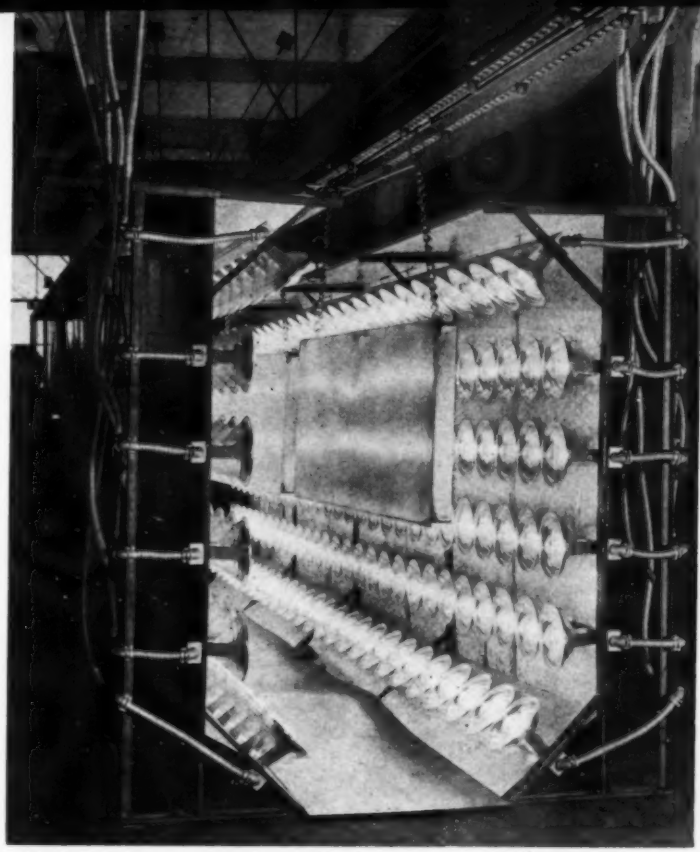
Uniquely featuring the Dole cold plate is the near-absolute vacuum created in the interior of the plate, this being accomplished after assembly of the refrigerating coils within their steel jacket, and the introduction of the solidifying eutectic "hold over" solution on which the efficiency of the unit hinges. Maintenance of that vacuum depends on perfect workmanship in welding the steel jacket and the provision of suitable protection against rusting of the thin gauge steel when the plate is in use. Naturally, if rust were to eat through the steel, the vacuum would be destroyed.

For 15 years, insurance against future rusting has been provided by a metallizing process whereby a finishing coat of molten zinc (and, in some cases, aluminum) was applied on the outside surfaces of the plate as the final step in the manufacturing process. The zinc, 99.8% pure, was simply sprayed on and the finishing job was completed. Nothing better than zinc has ever been found to meet the rustproof standard on which the company insists.

Then came the national armament program, Pearl Harbor and War—and both aluminum and zinc, the military uses of which are many, were placed under strict allocation. The vacuum cold plates, however, were still in demand for refrigeration in army camps and on ships transporting perishable foods to our forces abroad, so steel was obtainable and the company was permitted to continue operations, although on a reduced schedule. But, even though on a 100% war production basis, zinc and aluminum were definitely out.

Rustproof Protective Coating Required to Replace Zinc

"It was up to us," related F. T. Richards, factory manager, "to find the next best material to produce that rustproof finish coat. For a



Infra-red baking tunnel through which "cold plates" are conveyed to bake the enamel.

time we experimented with some eight or ten air-dry finishes, but they did not work out satisfactorily. For one thing, they did not adhere to the steel. They didn't solidify properly, or they were too brittle and, when subjected to temperatures of 45° to 60° below zero, which our plates provide, they went to pieces, leaving the steel exposed to the corrosive action caused by dampness in the places where the plates are utilized."

Baking the finish was experimented with (that is, using one type of baking equipment) but that too proved unsatisfactory for producing the desired rustproof finish. Because of supply conditions in the lacquer field it was not always possible to get the same material from one manufacturer continuously, and uniformity of color could not be maintained. One batch of lacquer, after drying in heat, came out beautifully; but the next batch,

FAMOUS

"WHIZZER" WHITE'S GREAT FINISH!

DENVER, NOVEMBER 17, 1937— POINTING BOTH FOR A RHODES SCHOLARSHIP AND THE HIGHEST SCORING RECORD FOR 1937, "WHIZZER" WHITE, COLORADO UNIVERSITY'S GREAT ALL-AMERICAN QUARTERBACK WENT INTO THE LAST GAME OF HIS COLLEGE CAREER WITH ALL HIS OPPONENTS SET TO GET HIM. WITH THE EXPERT CONSENSUS THAT THE STRAIN OF HIS STUDIES PLUS A SPECIALIZED DEFENSE WOULD STOP HIM, THE "WHIZZER" TURNED ON HIS MOST BRILLIANT DISPLAY OF SPECTACULAR RUNNING, PASSING AND DECEPTION, TO DEFEAT DENVER 34 TO 7 – SCORING THREE TOUCHDOWNS HIMSELF, PASSING FOR TWO MORE AND KICKING FOUR CONVERSIONS – TOPPING ALL SCORERS WITH 122 POINTS FOR THE YEAR, IN ONE OF THE GREATEST FINISHES OF FOOTBALL HISTORY.

PITTSBURGH

FINISHES

CONSULT YOUR PITTSBURGH MAN

FOR THE RIGHT FINISH EVERY TIME!

AS IN THREE PAST WARS, THE PITTSBURGH PLATE GLASS COMPANY'S TECHNICAL MEN ARE WORKING WITH MANUFACTURERS THROUGHOUT THE COUNTRY, HELPING TO DEVELOP THE BEST AND MOST EFFICIENT FINISHES FOR THE VARIOUS PHASES OF WAR PRODUCTION. WITH THE BACKING OF PITTSBURGH'S LARGE RESEARCH FACILITIES AND WIDE CONTACTS IN INDUSTRY YOUR PITTSBURGH MAN IS EQUIPPED TO FIND THE SOLUTION FOR ANY FINISHING PROBLEM. USERS OF INDUSTRIAL FINISHES CAN SAVE TIME AND MONEY BY CONSULTING OUR EXPERTS. A PITTSBURGH REPRESENTATIVE WILL BE GLAD TO CALL AT YOUR CONVENIENCE.

PITTSBURGH PLATE GLASS COMPANY

INDUSTRIAL PAINT DIVISION • PITTSBURGH, PA.

FACTORIES - MILWAUKEE, WIS.; NEWARK, N.J.; HOUSTON, TEXAS; LOS ANGELES, CAL.; PORTLAND, ORE.

THE THRESHER VARNISH COMPANY .... DAYTON, OHIO

Industrial FINISHES

secured, perhaps, from some other source, would come through looking otherwise. So it was thumbs down on baking by the equipment then available in the plant.

Infra-Red Baking Plus Conveyorization

Prior to becoming associated with Dole Refrigerating Co., it so happened that Mr. Richards had had a long experience in various Detroit manufacturing plants. In Detroit he had become familiar with the infra-red baking process as developed by Ford Motor Co., and later adopted widely by other industrial plants.

Organizing a sort of post-graduate course for himself, Mr. Richards inspected many infra-red installations, discussed his problems with experts, checked with the experiences of operators and ultimately convinced his employer that infra-red radiation would solve the Dole Co. finishing difficulties.

The finishing system, including spray booth, conveyor line and drying tunnel, which went into use last February in the company's plant at 5910 N. Pulaski Road, was designed by Mr. Richards.

At the final assembly point in manufacturing operations, the vacuum cold plate is suspended on an overhead conveyor that has a total length of 180-ft. Kilowatts being much in demand throughout the Chicago industrial area, electrical power has to be conserved wherever possible. Up to the point, therefore, where the cold plates enter the baking tunnel, movement of the overhead conveyor is strictly a matter of muscles. Man-power, in other words, moves the conveyor load into and out of the spray booth, and then, at the exit of the drying tunnel manpower again propels the finished cold plates by conveyor to the shipping room.

The spray booth is 14-ft. in length and has two exhaust fans. It provides room for two operators to work. The company is now using a corduroy wrinkle enamel made especially for infra-red baking.

From the illustration that accompanies this article, the general design of the drying tunnel is readily apparent. It is 20-ft. in length and contains 336 infra-red lamps of 250 watts each. These lamps are mounted in two vertical banks, each containing six rows of 28 lamps with Alzak reflectors. A temperature of 250° F. is used to bake the enamel.

To carry the freshly sprayed cold plates through the tunnel an overhead conveyor was designed. It consists of two parallel sprocket chains driven by a motor. At intervals of 2-ft. on this sprocket-chain conveyor there are projecting lugs. When the man-powered conveyor reaches the tunnel entrance these lugs engage a crossbar placed at the point where the load is suspended, thus readily effecting a transfer of the load to the motor-driven conveyor. The conveyor has three speeds forward and one in reverse. For best results a speed of 18-in. per minute has been found most suitable for the drying.

Results From Change

Results, Mr. Richards admits, are still not all that the company would desire. Infra-red heat, by penetrating to the interior of the paint film, as well as acting on its exterior surface, overcomes the faults previously experienced in air drying and hot-air baking.

But enamel, he says, while it provides a rust-resistant finish, does not make the cold plate rust-proof.* He admits, however, that there is a more important finishing

*See note at end of article.

"We'll FINISH the Job —with EGYPTIAN!"

Egyptian lacquers, enamels and synthetics have been giving permanent satisfaction under extreme conditions for a long time. As one of the oldest manufacturers of specific finishes it was natural that our chemists should gear our line to the war effort and develop new formulae to fill exacting Government specifications.

To aid you, whose products are used directly or indirectly in one or more branches of the Service, we have prepared a book giving many of the more important Government finish specifications. Naturally there's an Egyptian Finish for each one. This valuable loose-leaf book, which will be kept up-to-date by additional sheets as new specifications are issued, will be sent to every legitimate manufacturer who writes us on business letterhead giving title and the general character of the war contract involved. Just ask for Government Specification Book IF-10.

THE EGYPTIAN LACQUER MANUFACTURING CO.
Rockefeller Center **New York**

EGYPTIAN FINISHES

EGYPTIAN
Superior **FINISHES**

job to be done along the Berlin-Rome-Tokyo axis before Dole Refrigerating Co. can hope to resume use of the zinc finish.

Careful weighing of all factors involved and comparison of cost figures reveals that the new system has resulted in a 20% reduction in production costs for the company's products. And that, he says, is something of an achievement to balance against mounting taxes and the other ills that harass practically every industrialist.

Contemplating the future, Mr. Richards believes the company will continue its use of synthetic lacquer or enamel finishes, with infrared baking for some items of its line on which this type of finish can be used satisfactorily.

**Editor's letter to Mr. Richards:*

Regarding your statement, "But enamel, while it provides a rust-resistant finish, does not make the cold plate rustproof," we are just wondering if you give your steel surfaces any preliminary rustproofing treatment such as Bonderizing? If not, is there any reason (other than extra cost) why this can't be done? If the steel were rustproofed by Bonderizing or by some other similar rustproofing treatment, and then coated with a good bake finish, it would seem to us that you would have excellent protection against the possible formation of rust.

We would like to make this point clear before publishing the article, as this is sure to come to the minds of our readers.

Mr. Richards' reply:

In regard to enamel "rust-resistant," the point I was trying to bring out was in comparison of the metallizing process we were using of zinc against any enamel.

The Bonderizing method is a very good process for enamel or finishes of this character but, to my mind, does not compare with the metallized zinc finish. We prepare our metal before baking by the Metal Prep process. While Bonderizing goes into a lot of equipment, it also runs into money.

I still say that enamel is rust-resistant but not rustproof, as compared to the metallizing process. There is a tendency for enamel to flake with a blow, even after Bonderizing, while the metallizing is not as apparent. Hope I make myself clear.

Protects Special Hazards

WE ARE all more or less well acquainted with automatic sprinkler systems which require a network of piping over the entire factory protected, and it is certainly a good thing to be protected in this manner. In the case of special fire hazards, however, it is comforting to know that you can install an automatic chemical sprinkler system right at the point of greatest hazard—for example, the spray booth, dip tanks and similar places.

A tank containing extinguishing liquid is the basis of the system. An air compressor is included to maintain constant pressure in the tank and in the pipe line leading from the tank to the protected area and to the sprinkler head.

The sprinkler head is much like that of any sprinkler head; it has a fusible link which promptly melts in the event of fire. The chemical used vaporizes immediately on contact with heat. It forms a heavy blanket which excludes the air and therefore the oxygen, extinguishing the fire. Under actual tests with this equipment, fires have been extinguished within one minute.—E. H. J.

Ideas for Upping Production

In a move to speed the pace of war production, formal launching of a new organization to be called the National Association of Suggestion Systems was announced in Chicago recently. In a statement following a meeting at the Palmer House, Mr. Taylor, president, explained that the association hopes that "by stimulating millions of employes throughout the United States to produce suggestions, we will go a long way toward winning the war."

The association will do everything possible to aid the production drive, he said, by encouraging the elimination of waste and the rewarding of employes for suggestions that will create better and more efficient methods of operation in factories, shops and offices.

When Infra-Red Reflecting Paint is Required..

ARCO INFRAY*

FILLS THE BILL

● Increasing demand for the use of infra-red reflecting camouflage paints in every phase of the war effort makes it vital that manufacturers have full information on this new type of paint. Arco INFRAY, the infra-red reflecting paint, is ready with detailed specifications meeting government requirements. Write today for full details on INFRAY'S many war-time uses.

*Trade Mark Reg. U. S. Pat. Off.

Paints for Industry **THE ARCO COMPANY**
CLEVELAND, OHIO • LOS ANGELES, CALIFORNIA

· Speed-up hints on wartime (nis

1. PROPER FILM THICKNESS HELPS WAR OUTPUT

▶ It is poor economy to spray a film that's too thick or too thin. It wastes precious time and vital materials. One method of checking film thickness at regular intervals is by use of the *induction gauge* pictured here. While not quite so accurate as the micrometer method (bottom, right), it is quick and convenient for frequent check-ups.

2. HOW THICKNESS AFFECTS WAR EFFORT

▶ Correct thickness of film is not only good economy, but also good patriotism. If the correct thickness for a particular application should be *two* mils, then a film of *three* mils is obvious waste of vital materials with no gain. A film of *one* mil is even more wasteful—with less durability, more rejects and poor appearance.

3. SET THE THICKNESS FOR EACH JO

TOP. *Total thickness of* film [illegible] metal *measured with the micro[illegible].*

BOTTOM. *Film scraped* [illegible] Metal *alone measured. The di[illegible]nce is* film *thickness.*

• • •

▶ According to your per[illegible]nance standards for appearance [illegible] durability, arrive at the desi[illegible] thickness for each application. [illegible]n use the micrometer method, [illegible]uction gauge, or both, to establ[illegible] thickness and check it regula[illegible]

...nishing...*from the Du Pont Man*

MAIL THIS COUPON—

SEND TODAY FOR DU PONT HELP... FREE INFORMATION AND SERVICE!

☐ ***How to speed painting operations and save materials!***

Handy pocket-size, fully illustrated, 16-page booklet, *"Hints on Wartime Finishing Economies."* It shows 11 points to check for greater efficiency and speed in wartime finishing.

☐ ***Bulletins on Government-Specification Paints!***

Each bulletin covers specifications for a particular branch of the armed forces. Includes color chips and details on application, drying time and other factors for establishing production schedules. Write here the government contract items you are interested in finishing:

_____

_____

☐ ***How to meet emergencies and solve finishing problems!***

Du Pont has a staff of skilled Service Engineers, or "trouble-shooters," ready to help you... straighten out "kinks" in your finishing processes... locate trouble before it bothers you... or take care of it quickly when it arises. They have the "know-how" gained from experience with the finishing problems of many industries. They're ready to serve you on war-contract finishing. Write about your problem. Or wire in case of emergency.

NAME_____

FIRM_____

ADDRESS_____

Send this coupon to: **E. I. du Pont de Nemours & Co. (Inc.) 7146-O Du Pont Building, Wilmington, Del.**

(This coupon good only in the U. S. A.)

GKS..... FINISHING SYSTEMS

ANSWER YOUR

WARTIME PROBLEMS

★

Uncle Sam is asking you for wartime production on a gigantic scale. This makes it next to impossible to foresee all of the production problems that may arise.

GKS ovens are built to meet today's wartime requirements and tomorrow's peacetime quality.

Standardized parts provide economical cost, yet fit your needs exactly.

Phone, Wire or Write for Complete Details

GEORGE KOCH SONS, INC. Evansville, Ind.

Silk Screen Stenciling Used Extensively

BY BERT ZAHN
Graphic Art & Display Materials

THE silk screen stencil industry has changed tremendously in the uses this process has been put to. In its early stages it was primarily used to reproduce real estate signs; then various markings on equipment, and for other types of signs and displays. Now, in the war effort, it is being used extensively for marking automotive equipment, airplanes, army camp headquarters' streets and signs, as well as shells and personnel clothing.

Recently I saw large shells upon which the code number, as well as other information, was stenciled. Formerly it required from three to five minutes to put on one stencil. After a very simple roller was devised and connected with the silk screen, the shells were rolled under the screen and printed at the rate of about 60 per hour.

Insignia for Airplanes; Instrument Panels; Uniforms

Up to the present time most of the insignia used on airplanes have been decalcomanias. This was true also of tanks, jeeps and other equipment. Now silk screens are being made to fit directly into place on this equipment and the colors are silk-screened directly onto the surfaces. This assures excellent adhesion and long life.

The new instrument panels on the large Ford bombers, as well as the testing equipment on practically all surfaces, are being silk-screened. Etching compositions are being run through the screen onto various metals which, in turn, etch the design onto that particular surface.

Various metal tags that were formerly made of aluminum, brass, etc., and etched, are now being replaced with plastics which are silk-screened. Recently I saw completed, a marking system and instructions on the electrically heated aviation uniforms.

In a certain large army air field in this country, where foreign pilots are being trained—and of course deaths do occur—men who die or are killed are buried in this country and their graves are marked by special markers which, in turn, are silk-screened and a black smaltz is dropped onto the silk screened surface.

Most of the army camps have sign and process departments of their own, where morale-building signs and displays are turned out.

As a matter of fact, in Arkansas one of the large camps employs several American Japanese, who are in the service, to do this type of work.

Many plants that are building packing equipment, as well as the basic item itself, are using silk-screen stencils to mark the equipment as well as the shipping cases.

In the early days of the silk-screen process there were no organized supply houses that could furnish all of the equipment, including the screens. This prevented many firms from using the silk-screen process. With many supply houses and certain engraving houses making silk screens, and the possibility of getting all the equipment as well as the original art work done by one house, it means that the manufacturer has to have only one man assigned to the job—and even he need not have long experience in this type of work. With the modern facilities available it is now possible for practically any shop to use this process.

Better Materials Available

Within the past several years the larger paint companies have placed their chemists to work in developing colors for the silk-screen process, to be used on different surfaces, and for practically all purposes. This has taken the guesswork out of the silk-screen industry.

Of course, silk being extremely hard to get, substitutes have been perfected, the best being nylon. However, there is a temporary shortage of this material, due to the Government requisitioning nylon for parachutes. But I understand there is still plenty of silk, organdy and other textiles available to do silk-screen process work. All in all, this industry has not been affected too greatly by "critical" materials.

Any problem on reproducing any quantity of lettering, design or insignia on any surface will be answered, by the author, through INDUSTRIAL FINISHING Magazine.

Company Changes Name

Effective Oct. 1, 1942, Newcomb-David Co., Inc., Detroit, Mich., is to be known as Newcomb-Detroit Co. This company, established in 1912, manufactures spray booths, dust collectors, exhaust and ventilating systems, drying ovens and other sheet-metal equipment used for industrial purposes.

Continuing as President is Cyrus B. Newcomb, one of the founders of the original company. Clarence A. Dauer is Vice President and Ian B. MacLellan is Secretary, Treasurer. Other officers are Avon L. Newcomb, Assistant Secretary, and William T. Quick, Assistant Treasurer. The remainder of the company personnel remains intact.

The Newcomb-Detroit Co. will continue to operate in its present plant at 5741 Russell St., Detroit, Mich. This plant, during the past year, has been enlarged to more than double the previous production capacity.

Aluminum Industries Awarded Army-Navy E

On Sept. 12, 1942, Aluminum Industries, Inc., Cincinnati, Ohio, manufacturer of Permite aluminum and magnesium alloy castings, and Permite Industrial Finishes, was awarded the Army-Navy "E" for high achievement in the production of war materials.

The presentation ceremonies at Crosley Field, home of the Cincinnati Reds' baseball team, were held before a large audience comprised of Aluminum Industries officials, employes, families and friends. The speakers included Governer John W. Bricker of Ohio, in addition to Lt. Col. W. R. Martin of the Army, Commander G. H. Bowman of the Navy, and members of Aluminum Industries' management and workers.

In accepting the "E" Award on behalf of the company, Vice-President Harry J. Hater said, "I pledge the full and continued devotion of our workers to the cause of Victory. They will stand by their guns until the enemies of the American way of life are completely beaten and destroyed."

A Dependable Source of Supply for . . .

PRIMERS — SURFACERS
LACQUERS—WRINKLES
SYNTHETICS

PROTECTIVE COATINGS

. . . . that stand the pressure of unusual stress or strain; that protect against unreasonable weather conditions; that are flexible to the utmost requirements; that adhere to all surfaces, and conform to Government specifications — are standard goods with Walker. Write us for particulars.

H. V. WALKER CO.
Elizabeth, New Jersey
MODERN PRODUCTION FINISHES

How to Use Wood Filler

What points to consider in selecting a good filler; how to mix and apply it; when and why we use slush coat filler; how to rub off excess filler and what to use; how to slow down the drying; what tests to make to obtain accurate comparisons of performance among different makes of fillers; special colors; trying coatings under and over fillers.

BY
HENRY NOVAK

THE relatively small cost of the filler used on a piece of furniture is trivial when compared to the importance of the final finish. It is one of the most important operations needed to secure a fine sturdy finish. I believe there should be more supervision and inspection given to the filling operation; and more time taken to explain to the men why this operation is being performed.

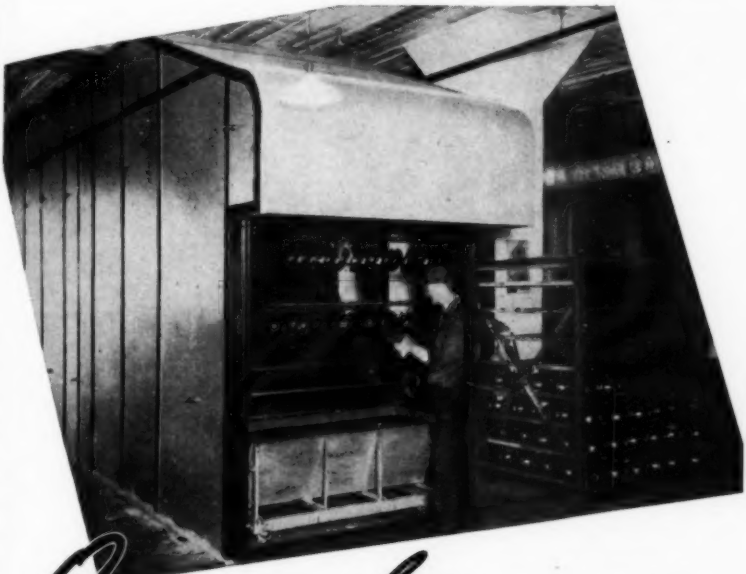
Too often inexperienced men or young boys are given the job and just told to "brush it on and wipe it off." I've seen this done time and time again; saw them wipe off the filler while it was still wet, and they wiped it with the grain of the wood, thinking they were doing it right. Naturally the pores were left open; it looked like a wiping stain operation instead of a filled job. A good filled finish can't be expected from this sort of work.

Mix Filler Accurately and Keep it Agitated

When mixing up a batch of filler, always weigh the amount of filler paste, and measure the correct proportion of thinner accurately. For uniform results, agitate the mixed filler frequently, as some solid material settles to the bottom rather fast. Large users of filler, doing brush work, have mechanical agitators to keep the material thoroughly mixed and uniform in consistency.

For close-grained woods, such as prima vera, mahogany, aspen, satinwood, etc., 9 to 10-lbs. of paste filler to the gallon of naphtha is sufficient for brush work, although I have seen remarkably good results with 8-lbs. to the gallon—as used by a large manufacturer. For woods that have large pores, such as oak, walnut, pecan walnut, Philippine mahogany, rosewood, etc., from 10 to 12-lbs. of paste should be used to the gallon of naphtha.

Fillers from different manufacturers will vary, as I have found by experience. Follow the filler manufacturer's directions and recommendations. If it doesn't quite suit you, make various small batches with different weights of paste to the gallon of thinner, and apply on one panel divided equally so as



One man alone OPERATES THIS FINISH BAKING SYSTEM

With the growing manpower shortage, this Despatch Continuous Conveyor Finish Baking Oven fills a definite war time need.
Just as this oven, operated by one man alone, handles tons of small electric motor parts which formerly required three or four men, so can thousands of ordnance items be processed with equal ease.
Despatch offers you 108 standard models to choose from, and prompt quotations are assured on special requirements. Phone, wire, or write today for your local Despatch engineer to help you with your finish baking problems. Ask him for interesting bulletin No. 51.

SEE TORRID—THE DESPATCH WIZARD—NATIONAL METAL SHOW

Prompt deliveries get you in production faster

DESPATCH
OVEN COMPANY MINNEAPOLIS

to have the various batches on the same plywood panel; each filler will then be on the same piece for comparison. Then compare results.

To Get Slower Drying

Some finishers have the habit of adding boiled linseed oil to retard the setting of the filler. I would advise against this, as the experts in laboratories have spent considerable time in working out the formulas, and these are usually tested by practical experienced finishers.

If the filler really needs slowing up because weather and drying conditions require it, or because of the size of pieces being filled, and taking into consideration everything in general, I would suggest that the filler manufacturer add the oil at the plant, before it is shipped to the user. Oleum spirits (as much as 15 to 25%) can be added to the VM&P naphtha, if it is necessary to "hold the filler open." On woods that have large deep pores, the fillers can be made with larger mesh silex or silica, just as you would use large stones to fill a large cavity and small ones to fill a small opening.

Slush Coat Filler; Where and Why it is Used

Many manufacturers of case goods, dining room furniture and radio cabinets, where solid gumwood, birch and maple are used in conjunction with walnut and mahogany veneered surfaces, do not fill the entire piece with their regular mixture of filler. For the veneered surfaces they use their regular "10-lb. of paste to the gallon of naphtha" mixture, but on the gumwood and other combination solid woods they use a "slush coat" filler made up in the proportion of about 3-lbs. of paste to the gallon of naphtha.

A heavy filler isn't necessary on gum, but a slush filler will help hold out the sealer and lacquer coats; it also brings out the figure in the wood and gives depth of color. The slush filler is much easier to wipe and clean off than the heavy filler. A non-grain-raising stain is usually sprayed on before filling.

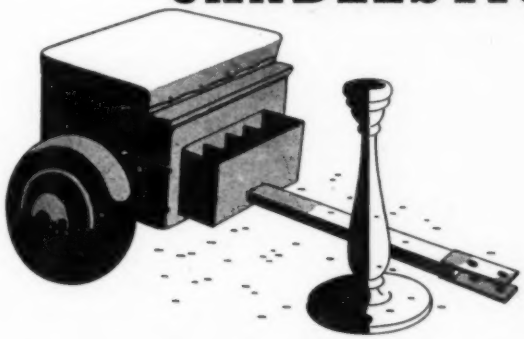
Another example is to take a dining room table that has a walnut veneered top with the apron and base of solid gum. You spray non-grain-raising stain over the entire table. Fill the top with a 10-lb. cut filler, but use a 3-lb. cut filler of the same color on the base and apron. This acts more or less as a wiping stain and fills the tiny pores, brings out the figure of the gum, and holds out the finish more so than either a non-grain-raising stain used alone or a permanent wiping stain used alone directly on the bare wood.

Take a gum panel and spray it with non-grain-raising stain. Then slush fill one-half and finish with lacquer. Notice the difference in holdout and body. Do likewise with non-grain-raising, pigment wiping stain, and slush filler, and then compare these three.

Spraying Filler

For spray application, the filler should be cut 6 to 7-lbs. of paste per gallon of naphtha. Here is where oleum spirits might have to be added, due to the rapid evaporation of the VM&P naphtha while being sprayed. This filler should be sprayed from a pressure tank equipped with an air agitator to keep the filler in suspension. Use about 25 to 30-lbs. of air at the gun and approximately 5 to 8-lbs. on the tank. Some finishers use more or less than this, depending upon the type of equipment being used.

CAISSONS AND CANDLESTICKS



It's true that caissons and candlesticks are at opposite ends of our present Emergency Production Drive.

However, somewhere in between these ends is your own finishing requirement and there is a Nason chemist and a Nason Product waiting to serve you.

Our laboratory technicians are trained to analyze and solve every problem that comes into our plant. Whether it is a new formula for material to finish army caissons or a test of a regular product on a novelty candlestick, your problem receives the same careful attention.

Now, when TIME and SPEED mean so much, let us help you to "keep 'em rolling."

R. N. NASON & CO.
manufacturers
PAINTS • VARNISHES • LACQUERS

NASON *fine finishes*

151 POTRERO AVENUE, SAN FRANCISCO • 2201 BARRANCA STREET, LOS ANGELES

Before filler is applied, the bare wood surfaces should be well dusted to clean the pores of all wood sanding dust. Where filler is applied by brushing, brush it well and evenly on the work. Let it set until it is flat or dull. When you can run your finger across the grain and it cuts clean, it is ready for wiping.

Pads for Rubbing and Pressing Filler into Wood Pores

For rubbing the filler—pressing it into the pores of the wood—I prefer a hard felt block such as is used for rubbing pumice stone with oil or water. Or, cement a ¼-in. thickness of felt to the flat face of a wood block 3x3x5-in., the top of which is shaped to fit the hand. Stretch a piece of thin leather over the felt side of the block and tack it to the sides of the block.

If there is an upholstery department in the plant (as there was where I once worked) have the leather cutters make up leather mitts without thumbs, just sewn at the top and back where the thumb would fit to hold the glove while using. These mitts can be used as wiping pads on large surfaces such as dresser tops, table tops, etc. The filler should be worked in by circular motion and then cleaned off with sugar cloth or beef cloth.* Have a metal scraper fastened to the filler bench, and use this to clean the pads and blocks whenever they become too filled with filler.

With a cloth, always wipe against the grain, that is, across the grain and then lightly with the grain so as to avoid leaving any cross-streaks. Some finishers use tow, burlap or sea moss for preliminary cleaning. If moss is used it must be moistened by sprinkling with water; otherwise it will be too dry, coarse and brittle; it would break up, and dust, and wouldn't clean.

Cleaning Filler From Inside Corners

Never clean corners, where veneer is used, with bristle scrubbers. Use wood dowels sharpened on pencil sharpeners to clean corners. One manufacturer had open pores on identical cabinets in the same place, and the rubbers were having difficulties trying to rub the spots down so as not to show open pores. I traced it back to the men who did the filling. They were using 4-row scrubbers and, when cleaning, they came in contact with the veneer and naturally were brushing the filler out of the pores. I had them use only dowels and rags on these corners. These cabinets were marked. When the rubbers

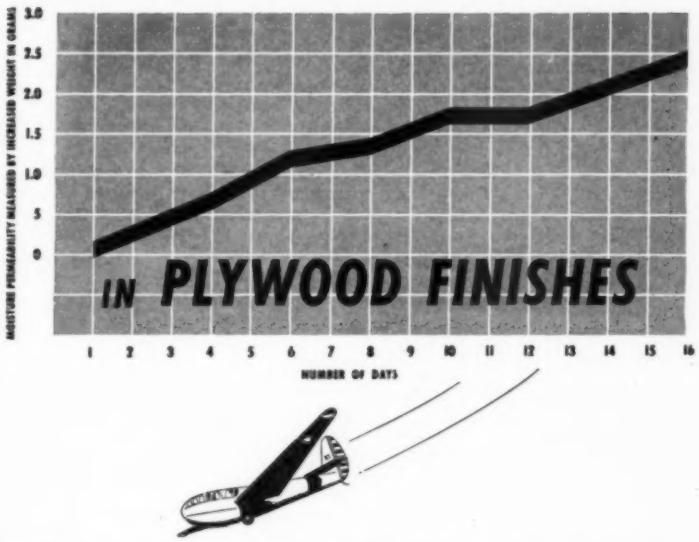
---

*Beef cloth is a material that is used over meats for shipment. This is a soft cleaned and sterilized cloth that holds and wipes the filler very well. I used it for years with excellent results. It isn't a cheap cloth, but it paid for itself in the long run. We could shake the filler out of the cloth and use it several times. It gathered and held the filler off the work very well.

Sugar cloth is the laundered and sterilized sugar sack linings. This material is soft and it cleans off the surface well. It is a closer mesh than beef cloth. I prefer beef cloth because of the larger mesh. If the mesh is too close or too fine it acts too much like a filler pad and becomes clogged or padded with the filler too quickly. These cloths can be obtained in bundles of specified weight or in bales. Any concern handling wiping rags, waste, etc., should be able to furnish the beef cloth and sugar cloth.

There is another filler wiping rag that can be rented at a certain amount per piece. It is about the size of a small guest towel and is of a soft texture. When dirty, these rags are returned and are cleaned ready for use again. In some localities they can be rented from a towel service company, and probably some dealers in wiping rags handle them. A number of large furniture manufacturers are using them.

WATCH THE MOISTURE LINE IN PLYWOOD FINISHES



The primary function of a Plywood Finish is to prevent moisture from passing into or from the Plywood it covers. Unless a finish does this, the durability of the finish is of little value.

All TUF-ON coatings for Plywood Finishing are based upon this premise. TUF-ON sealers are especially formulated to prevent moisture permeation that would reduce the strength of Plywood, change its weight, raise the grain, or cause warping. While TUF-ON Finishes meet all and even go beyond present requirements for durability, they are unquestionably pointed up to moisture resistance.

The Industrial Research Division of Wipe-On Corporation has charted the moisture resistance factor of various types of sealers and finishing systems. In considering Plywood Finishes, watch the Moisture Line. Be sure that the system you adopt is not only strong, flexible, and lasting, but that it *keeps moisture from passing into or from the Plywood.*

Send for the new TUF-ON circular, "Watch the Moisture Line." It shows comparative charts of interest to every Plywood airplane manufacturer.

TUF-ON
PLYWOOD FINISHES

Industrial Research Division of Wipe-On Corp., 105 Hudson St., New York

received and rubbed them, they were perfect.

Carpenters' pencils can be used to clean routings and at the same time they will serve for darkening the light-colored crossbanding that shows through the routing.

Choice of Filler

Where a great variety of fillers are on the market, it is sometimes difficult to make a choice. A good filler should have these qualities or characteristics:

1) Thorough filling of the pores.
2) Minimum shrinkage.
3) Clear tone, free from muddiness or gray tone or blotches.
4) Must not turn gray in pores after the surfaces have been finished.
5) Filler in pores should not lift or raise after the surface has been finished.
6) Ease of wiping; filler should wipe free and clean without smearing, and should wipe without a sticky pull.
7) Should dry in specified time.
8) Top coats should have good adhesion over filler.
9) Should stay in suspension a reasonable length of time and should not settle hard.
10) All thinner in filler should evaporate during drying period.
11) Filler should not bleed when lacquer sealer or lacquer is applied over it.

A suggested way of testing some fillers is as follows: When testing walnut fillers, test them on walnut veneers, mahogany on mahogany veneers, etc., for the best results.

Comparing Mahogany Fillers

For mahogany filler get a large mahogany veneered panel and stain it with a deep rich orange-red mahogany water stain or non-grain-raising stain. Dry thoroughly. Washcoat, either with shellac or lacquer reduced to proper reduction, coating only one half of the panel. Let this washcoat dry one hour, and sand with No. 6/0 sandpaper. Now reduce the fillers from various manufacturers according to their reduction recommendations, making them all in the same color if possible.

Brush the fillers on the panel which is divided or spaced by routing lines across the grain, spaced evenly for as many fillers as are being tested, so that each filler will be on both the washcoated and unwashcoated stained panel. Let each filler dry until it is flat or dull. Wipe the filler across the grain and then lightly with the grain with beef cloth. Let the filler dry for the specified time and check each filler for ease of wiping. If it is an overnight oil-type filler, let the filler set about half an hour and check for wiping. It should wipe with ease and without streaking.

Now take glass slides and pour the same fillers on these and stand them at a 60° angle. Let them dry overnight. Next day, check the filler on these slides for drying and hardness, using a knife and thumbnail scratch test. The filler should be hard and dry. Spray lacquer sealer over one half of the slide and notice if there is any raising of the filler or the lacquer.

Sealer Coat Over Filled Mahogany

Spray one coat of sealer over the filled mahogany panel and watch for filler lifting or popping. This is usually caused by lacquer solvents dissolving undried oils that are in the filler. Some material will probably lift or pop, but will "dry down," but usually these will show shrinkage and an orange peel or rippling effect which, of course,

The Directive at Hilo is

TO DO OUR PART IN WINNING THE WAR

HILO

PROTECTIVE COATINGS

Protective Coatings are a necessary part of much War Equipment. Here at Hilo every effort is devoted to expediting all possible War Finishes. Some which are in work now are—

- **Lustreless Olive Drab and related Finishes for Motorized Equipment**
- **Crystals and Rip-pls for Directional Instruments**
- **Chemical Resistants Paints for Specialized Uses**
- **Synthetic Coatings for Naval Equipment**
- **Camouflage Paints for Various Needs**

These Protective Coatings and many others are available to meet Specifications of the Army, Navy, Maritime Commission, Air Corps, Chemical Warfare, Engineers, Ordnance Motor Corps, etc.

HILO VARNISH CORPORATION

42-60 STEWART AVENUE
BROOKLYN, N. Y.

2420 Washburne Ave.
Chicago, Ill.

Park Square Building
Boston, Mass.

Established 1863

is undesirable as it will show up and become magnified with subsequent coats of lacquer or varnish, unless it is sanded down very well —and this would run the sanding cost too high.

After the sealer has dried for one hour, sandpaper it with No. 6/0 abrasive paper, and pay particular attention to see if it sands harder on various filler sections; that is, if it seems to gum or discolor the paper. If it gums on some and powders on the others, that means that the filler isn't dry. It probably contains a retarding oil, and this has retarded the drying of the sealer.

If the sealer dust is discolored when sanding, it usually has oil dyes in it and these are quite fugitive to light. In other words, it will fade when exposed to sunlight. Get your color by staining the wood —by having the right shade of stains; then use a clear, bright clean filler without oil dyes.

Spray two coats of gloss lacquer (allowing two hours of drying time for the first coat) or one coat of gloss varnish. Watch this also for lifting or popping. Sometimes the solvents in the lacquers are too rich or strong and go through the sealer and into the filler and cause lifting. I have seen this happen and have seen other lacquers over the same fillers show excellent results. After this coating has dried, sand it thoroughly with No. 320 wet-or-dry sandpaper, using soap and water, or naphtha with a little rubbing oil added.

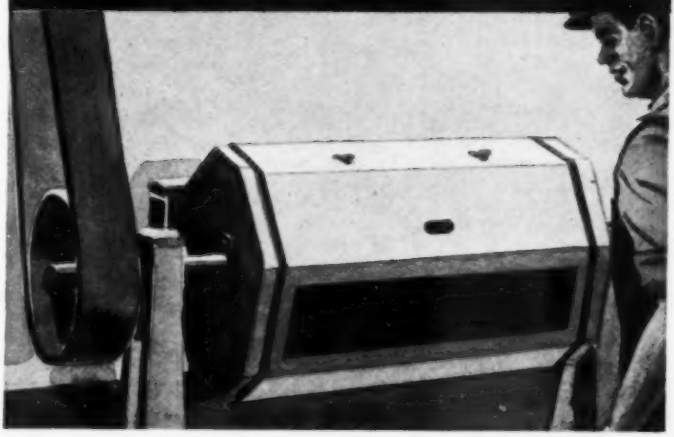
After the finish is cut down so that no irregularities show, then rub and polish with a good rubbing and polishing compound for a high sheen. This high sheen is intended for clarity. The finish should be free from any muddiness or graying of the pores. These objectionable effects show up readily on a high gloss finish. Now carefully check all fillers for depth, color, clarity and pores. This should also be done prior to sanding and polishing.

When Fillers Turn Gray

Of course, there are sealers that will turn fillers gray in the pores. This must be taken into consideration. I have finished large stained and filled panels using one stain, washcoat and filler, and then used about six different sealers in sections on this panel, and some bleached the filler very badly. I have tested fillers as outlined here and have always picked out the best filler and then tried them in production. Then, as a rule, the bugs can be found, if there are any, and eliminated.

If a finishing department has many special finishes, which also require special color fillers, it is always a good plan to carry a stock of natural and white zinc oxide fillers. The latter, being quite strong, usually doesn't need much of that. Also, carry a line of pigments ground in oil such as Van Dyke brown, burnt and raw umber, burnt and raw sienna, bone black, ivory drop black, red oxide, chrome yellow and orange, Indian red, chrome green, white and various others, depending on the color of finishes that are being used. I have used them all. Also, with these, your regular oak, walnut and mahogany fillers can be shaded to any shades needed or desired, making them either darker or lighter. I always weigh fillers and pigments and keep the formulas for repeat orders of furniture of that special shade. I have done this for many years and have made hundreds of various shades of filler for special color finishes, novelty and conventional.

TUMBLE FINISHES FOR MILITARY ARTICLES



Speed up production of small military articles such as buttons and belt buckles with Berry Brothers One-Coat Semi-Gloss Tumbling Black.

Reduces 3-to-1. Tumble 30 minutes. Bakes 30 minutes at 350 degrees. Resists abrasion. Excellent acid-resisting properties (impervious to 20-minute boiling test, half benzole and half acetone).

Same type of finish also available in colors.

We will be glad to mail further information promptly upon request.

Quality Finishes Since 1858

BERRY BROTHERS

Industrial Varnishes • Enamels • Lacquers

DETROIT, MICHIGAN • WALKERVILLE, ONTARIO

JERSEY CITY • BOSTON • CINCINNATI • CHICAGO • ST. LOUIS

Automatic Airpainting Unit

The following features are included in a new bulletin sheet which illustrates and describes a streamlined automatic airpainting unit manufactured by Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, Ill.:

"Paasche turntable units are compact in design, sturdily constructed, and occupy very little floor space. They are completely automatic, the only manual operation required being loading and unloading. The automatic airbrushes apply a perfectly atomized spray, providing a uniform high quality finish. They are simple in design, easy to adjust and all working parts are fully enclosed. To provide clean, dry air for the guns, a water, oil and dirt separator unit is supplied.

Type F990, 24-in. diameter turntable type automatic airpainting unit for shells, etc.

New . . .

MATERIALS SUPPLIES EQUIPMENT

"Explosion-proof electric motor drive and speed reducer are fully enclosed in housing, but are readily accessible through access door. The pressure-feed material tank has the 'Clamp-tight Cover', which can be removed and replaced in 15 seconds—a feature that saves considerable time in material handling.

"These units are constructed to rigid engineering standards and made to stand up under toughest production schedules. They are furnished complete, ready to connect to power and air supply lines.

"After work is loaded, it travels to coating station. Airbrushes go on, and pieces are rotated while being sprayed. The airbrushes are oscillated, following the shell during this operation. Airbrushes shut off automatically and return to starting position."

This equipment is especially effective for coating 20-mm, 37-mm and 40-mm. shells, clover-leaf end plates for 75-mm. shells, fuse caps, "AN" connectors, ogives, metal containers, grenades, booster casings and other parts.

Olive Drab Enamel

A new olive-drab enamel, specially formulated for war needs, is now available from S. C. Johnson & Son, Inc. Lusterless, made for heavy Army duty, it is now used on tanks and accessories, Army bicycles, air-corps repair docks, heavy-duty air-corps jacks and the like. It is adaptable to any surface where wear will be great.

Also available for use on war mate-

New Finishes for Aircraft Plywood

New finishing systems for aircraft plywood are currently giving aircraft manufacturers new production problems. Finishes must have minimum weight, production speed in application, resistance to moisture, protection against extreme changes in temperature and durability against the ravages of vibration.

Ault & Wiborg Corporation, a subsidiary of Interchemical Corporation, has just completed a report on an extensive research into plywood finishing.

Complete finishing systems have been developed and finished plywood has undergone severe tests, some for a period of several years. The systems are adapted to specific requirements differing for each of the woods used—birch, mahogany, fir, poplar, spruce. The development of materials and finishing systems has been conducted in cooperation with leading aircraft manufacturers and presently known requirements and specifications have been met.

The method of application can be varied to fit the production procedure and available equipment. The systems developed by Ault & Wiborg involve several operations depending upon the nature of the wood used in fabricating the panels.

Th data contained in the research report is of such a nature that it is not offered for general distribution. However, it is available to aircraft manufacturers or prime contractors who are directly involved in the production of plywood aircraft. Write to Ault & Wiborg Corporation, a subsidiary of Interchemical Corporation, Aeronautical Division, 75 Varick Street, New York City, New York.

IT'S A FIGHT TO THE FINISH

Ault & Wiborg finishes are now being used on shells, bombs, gas masks, expeditionary containers, and also as insulating coats for automotive, naval and aircraft wiring systems.

AULT & WIBORG CORPORATION

A SUBSIDIARY OF INTERCHEMICAL CORPORATION

rials is Johnson's Wax-O-Namel. It is used at present on Victory bicycles, life rafts, in cartridge and powder storage tanks for the Navy, shell boxes for army, etc.

Complete information on these special products may be had by writing S. C. Johnson & Son, Inc., Industrial Finishes Division, Dept. IF-11, Racine, Wisc.

Light-Weight Dust Respirator

The new Willson No. 10 Respirator is an outstanding contribution to industrial safety and efficiency. It is one of the lightest weight respirators ever to receive U. S. Bureau of Mines approval. Here is an ideal combination of all the advantages and extra comfort of extremely light weight with dependable protection against harmful dusts.

This respirator is practical for long periods of time without impairing workers' efficiency. Unusual breathing freedom is provided through specially designed inhalation and exhalation valves. Elastic headbands are lasting and hold the respirator comfortably in place. Face piece is easily adjusted to fit the contour of the wearer's face, and is particularly adaptable for use by women. The design is extremely simplified. There are few replacement parts to get out of order. It is both serviceable and economical. The manufacturer is Willson Products, Inc., 312 Thorn St., Reading, Penna.

"Easy" Sander Is Improved

Production of practically every conceivable device for war or civilian use requires sanding, rubbing, or polishing. Finishing practices have received the careful attention of production heads and undergone a complete renovating. The importance of finishing operations in war production can not be too strongly emphasized. These operations consume the time of skilled workers.

Our armed forces and war plants have recruited reciprocating-type sanding machines for hundreds of finishing applications on new and maintenance work. These machines are extremely simple to operate and turn out 50 to 80% more work, of higher quality on even close tolerance jobs, than is possible by obsolete hand methods.

The reciprocating action of the "Easy" electric sanding machine, illustrated here, duplicates the back-and-forth motion of hand work. Speed of operation is 3,000 strokes per minute as compared to approximately 150-s.p.m. by hand. Power is furnished with a heavy-duty universal electric motor of special design—in either 115 or 230-volt models. The unit weighs approximately 7½-lbs.

The reciprocating action has proven practically indispensable in the production and maintenance of wood, metal, plastic, composition . . . . airplanes, parts, gliders, propellers, guns, searchlights, ammunition cases . . . . polishing dies and hundreds of other applications, sanding, rubbing or polishing — wet or dry — curved or flat surfaces.

To keep pace with the demand for speed, production and precision the manufacturer of the "Easy" reciprocating electric sanding machine, Detroit Surfacing Machine Co., 7433 W. Davison, Detroit, Mich., announces a new Model XLD. A feature of this model is a detachable bottom plate. This is the part the felt, rubber, or composition sanding pad is secured to, and over which the abrasive is attached.

The detachable bottom plate B, with ½-in. thick rubber sanding pad, can be instantly attached to the machine at A, with a light snap-on action.

This new type plate permits instant

Meticulous Grooming

Is Indispensable to Leadership

. . . it's true of people

. . . it's true of products

The style and quality of the finish applied to your product can make it a leader in its field or not, as you choose. Finish is that important! Despite present conditions we are furnishing finishing materials for civilian products equal to or superior to those formerly available.

We are also supplying manufacturers of war products with materials that meet U. S. Government specifications and tests. If you are in war work and have a protective coating problem, send us your specifications and requirements.

Inquiries for information or bids will receive prompt attention.

NO TAMPERING WITH QUALITY

ROCKFORD VARNISH COMPANY

Manufacturers of Protective and Decorative Coatings

ROCKFORD, ILLINOIS

removal of one type or size pad and installation of another. Detachable bottom plates are available with pads of sponge rubber, felt, or composition in widths from 1 to 3¾-in. and ¼ to 1-in. thick. Therefore, instead of attempting to use one pad for all applications, special pads are used to fit the specific job.

This feature provides for instant change-over from wet to dry work, without waiting for the pad to dry. If a wet pad is used with dry type abrasive papers, the moisture loosens the glue and destroys the abrasive. Also in rubbing applications where frequently several grades of compound are used, a separate and often a special type felt pad is indicated for each grade compound. Cleaning aluminum airplane skins or parts before welding, roughening laminated plastic sheets to provide bond for finish, finishing dies, anti-aircraft or machine gun parts also require special pads of correct size and degree of flexibility to fit the specific job.

Lithographic Process Inks in Color

The rapid growth of color photography has led to the need for better standards of reproduction in lithography so that the lithographer and advertiser could turn this new illustrative medium to practical ends. To meet this need The Fuchs & Lang Mfg. Co., Division of General Printing Ink Corp., 100 Sixth Ave., New York, N. Y., has issued a chart of lithographic process inks for the reproduction of Kodachrome and other direct color processes.

The key colors have been developed following careful study of hundreds of Kodachromes and they approximate the best average set of primaries. These standard colors are presented in different screen values, demonstrating the diversity of full and intermediate pure colors, tints, shades and modified tones possible with the four inks. The screen mixtures can be used as a guide for color correction and selection. This chart is not a gadget but a useful instrument that may be employed by the artist, art director, retoucher, engraver and lithographer to maintain accurate color standards throughout production. Duplicate runs have been made of the chart on offset and coated stocks to show the full possibilities of the inks on these two types of paper.

In keeping with F & L's high standard these inks are compounded with the best and most versatile pigments yet developed to interpret direct color photographs on paper through the use of lithographic processes. Copies of the Kodachrome chart (17x24-in.) are available to INDUSTRIAL FINISHING readers upon written request.

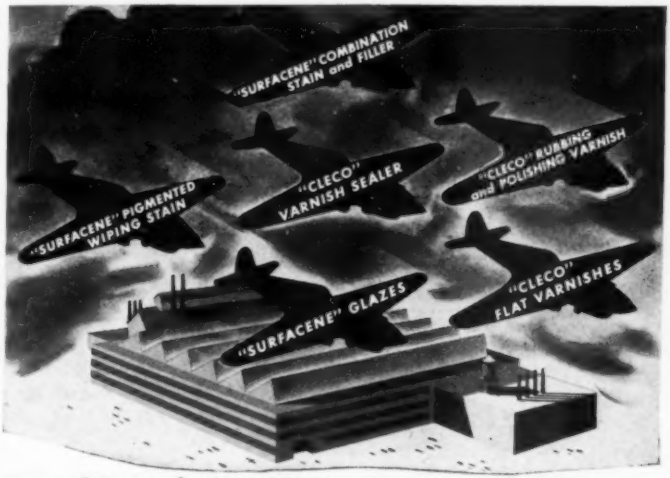
Beautiful Graining in Full Color

A recent bulletin issued by David Rautenbush, Graining Division Manager of The Meyercord Co., Chicago, Ill., manufacturer of Sans-Arb and Sans-Marb, points out that these finishing materials are actually fine lacquer bases as well as beautiful recreations of imported and domestic wood grains and marbles.

This is made possible, the bulletin states, through a scientific system of chemical reproduction of the originals. In re-creating fine wood grains, burls, crotches and exquisite vari-colored marbles, as high as seven and eight colors are imposed upon a heavy, super-quality film of lacquer in sheet form.

The photo-lacquer result obtained assures a flawless, true-color re-creation of the original wood or marble surface reproduced, while the heavy lacquer base provides a large part of the normal lacquer finish that would otherwise require several spraying operations in the finishing room.

The extreme flexibility of this heavy lacquer film, which permits application on virtually any smooth surface, flat or molded, also minimizes breakage or cracking where shrinkage or expansion of the base occurs. In spite of the hardness of its surface, which allows for considerable abuse, Sans-Arb actu-



Let this "umbrella" of war-proof finishes protect your output!

• The new Glidden Lines of SURFACENE Combination Stains and Filler and Cleco Varnishes and Sealers, are made entirely of non-critical materials and assure results of the highest quality at top speed.

"SURFACENE" COMBINATION STAIN AND FILLER—Combines these two operations, dries with superb clarity for sealing in 5 hours, cuts overall schedules 40 hours, saves application and handling costs.

"CLECO" VARNISH SEALER—Permits easy sanding in 2 hours, and is suited to either lacquer or varnish finish coats.

"CLECO" RUBBING AND POLISHING VARNISH—Dries out of dust in 1 hour, ready overnight for recoating, or to rub in 24-36 hours.

"CLECO" FLAT VARNISHES—Dry dust-free in 1 hour, hard overnight.

"SURFACENE" PIGMENTED WIPING STAIN for close-grained wood and **"SURFACENE" GLAZES** for plus tonal effects.

Send today a finished panel and sample of unfinished wood for color matching, and our practical service man will make a demonstration at your plant.

THE GLIDDEN COMPANY • **National Headquarters, Cleveland, Ohio**
Factories or Branches in Principal Cities

TIME-TESTED
GLIDDEN PRODUCTS CARRY THIS FAMOUS MARK OF QUALITY

GLIDDEN
Everywhere on Everything

ally impregnates into the pores when applied to a wood base.

Application of both the wood grains and marble patterns is fast and easy and does not require highly trained labor. Substantial savings in finishing operations, drying time and materials are reported by users in many parts of the country.

Sans-Arb and Sans-Marb are excellent wartime product finishing materials, for either custom or line production. They can be treated after application by shading, rubbing, overtoning or top-coated with any type of finishing material. There is apparently no probability of a scarcity of either Sans-Arb or Sans-Marb developing for the duration of the war. Large stocks are available in hundreds of patterns, many of rare and commercially unobtainable woods and marbles.

New Oil Protects Metal Surfaces

Announcement is made by the Chemical Development Laboratory of The Curran Corp., Malden, Mass., of a light "Polar K" oil which is claimed to have the unique and valuable properties of completely removing perspiration, water, oil and dirt from steel surfaces.

The new oil is said to be superior to alcohol for dehydrating and cleaning steel surfaces, bearings or similar parts which have become wet or have been left with a film of grinding emulsion.

The new oil instantly displaces and absorbs water and leaves a thin film of "Polar" type lubricant and rust preventive. The new "Polar" oil is said to be especially applicable for protecting, during storage, the water side of steam turbines, water pumps, meters and steel parts which may have been exposed to rain, immersion in sea water or damp storage.

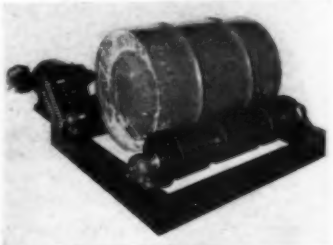
The fluid has also been found a natural for spraying the inside of Diesel and gasoline engine cylinder walls which have accumulated a film of condensed moisture as a result of storage in damp atmosphere. Its use for flushing crankcases to remove sludge, moisture and acid salts is being expanded.

The "Polar" oil is completely soluble in hydrocarbon and lubricating oils and no subsequent cleaning procedure is necessary to remove the thin, film-protective, rust-preventive lubricant.

The fluid neutralizes the salty acid touch of fingers. Strangely enough, according to A. F. Curran, Research Director, the presence of salt or perspiration (ordinarily causing rust under oil) increases the rust preventive characteristics of the thin film deposit left by the fluid.

Drum Roller for Mixing

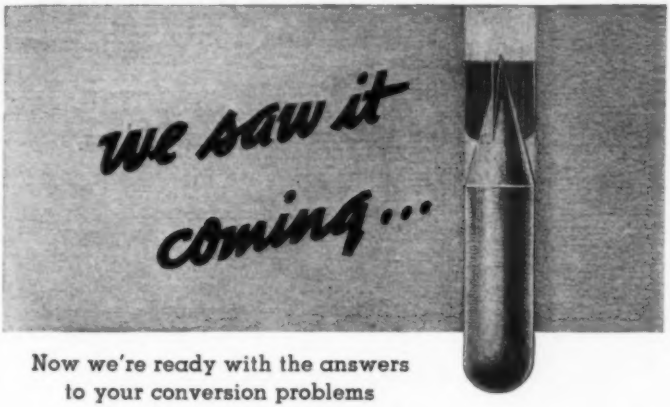
The Vol-U-Meter Co., 75 Wilbury Place, Buffalo, N. Y., has developed a motor-driven drum roller designed to rotate a drum of material as it is received from the supplier—either a filled or partially filled drum—to thoroughly agitate and mix the contents quickly and easily. By rotating the material in a closed drum the manufacturer points out the following desirable features:



For rotating drum to agitate its contents.

1) No solvent loss.
2) No fire hazard.
3) Nothing to clean.
4) Entire contents are thoroughly mixed to uniform consistency, color (if any) and pigment content (if any). The material is immediately ready for use.

Drum rollers are supplied in sizes to handle containers of 5 to 110 gallons capacity, and for any load or speed.



Now we're ready with the answers
to your conversion problems

The substitution of Black Plate for Tin or Terne Plate, along with a shortage of certain critical materials used in the manufacture of finishing coats, was a foregone conclusion long before Pearl Harbor. We anticipated this situation and put our laboratories to work. The result is a complete line of finishes which, although using no critical materials, meet the problems of practically every type of surface and condition of application.

Answer No. 5 --- For Bonderized Surfaces

A problem that has bothered many decorators, for instance, is the difficulty of applying a finishing coat to bonderized surfaces. Our laboratories have developed a formula specifically created to meet that difficulty. The new formula assures thorough coverage and adhesion by either the roller or spray method of application.

Write today for complete
information and samples.

TOUGH JOB HEADQUARTERS

℞ Prescription Finishes

Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

THE
WATSON-STANDARD CO.
Manufacturers of
PAINTS . . . VARNISHES . . . INDUSTRIAL
FINISHES AND LITHOGRAPH COATINGS

FACTORY AND GENERAL OFFICES: PITTSBURGH, PA.
WAREHOUSES: BOSTON · BUFFALO · DETROIT · NEW YORK

Brass and Copper Cleaner

The development of this product by Nielco Laboratories, 19720 Florence Rd., Detroit, Mich., is the result of a complete and careful study of the problem of cleaning brass and copper in defense plants fabricating these metals, where speed and efficiency are so highly desirable under present conditions. Every step of cleaning and bright dipping was carefully checked as to results obtained, and time required, the purpose being to eliminate waste operations, expensive equipment and critical chemicals, thereby saving labor and money.

Two formulas were developed to meet these requirements, one for use in still tanks and one for use in washing machines and agitated tanks. The solution with 4-oz. per gallon had a pH of 11.7, as indicated by a Beckman pH meter.

At a concentration of 4-oz. per gallon, at a temperature of 212° F., this product removed S. A. E. 50 lubricating oil in one minute and 32 seconds; and at 8-oz. per gallon, at the same temperature, in 46 seconds. The panels were .032 copper and were dipped into the oil, removed and allowed to drain for three hours at room temperature.

The surface of the cleaned panels rinsed freely with cold water, leaving no film of any kind whatsoever, evidenced by the fact that the rinse water on the panels formed a smooth unbroken layer, free from water break.

Puts Out Fire

The new Alfite carbon dioxide engine is approved by Underwriters' and Associated Factory Mutual Laboratories for use on both electrical and oil fires. It is equipped with an Anti-Statik horn to protect the operator from static charge, according to the manufacturer, American-LaFrance-Foamite Corp., Elmira, N. Y. It is designed for perfect balance at wheeling height, has a third swivel wheel for easy maneuvering, and a retaining latch which releases the horn instantly, yet holds it firmly in place when not in use.

For finish material and electrical fires.

It is recommended for fires in flammable liquids, alcohol storage, electrical machinery, and for other class "B" and "C" fires. It smothers fire instantly with carbon dioxide gas which expands, upon discharge, to 450 times its stored volume. It is non-corrosive, non-poisonous, odorless.

Foxboro Instruments Shown In New Catalog

Catalog 95-A, just issued by the Foxboro Co., Foxboro, Mass., describes its full line of instruments for the measurement and control of industrial process conditions. The contents have been prepared with great care, for completeness and accuracy, and is organized to make it easy for the user to choose the type of instrument best fitted to his needs. There are over 200 illustrations.

The 48 pages comprise ten sections, six of them grouping and describing all the instruments, accessories and supplies appropriate to a particular field of application, such as Temperature, Flow, Pressure, Level Humidity; while the remaining sections cover combination instruments, valves, instrument panels, and similar subjects. Thorough cross-indexing of the contents, plus an ingenious use of colors, makes this catalog a convenient and useful reference handbook of modern instrumentation.

IN STEP WITH THE TIMES

Industrial Finishes

that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

To Remove Gold Bronze

I have in my possession a mirror with either a wood or plaster-of-paris frame. Originally this mirror frame was finished with gold leafing and at some time or other gold bronze has been applied over the gold leafing.

It is my wish to remove the gold bronze, without disturbing the original gold leaf, and I am wondering if you can suggest a method for removing the gold bronze?

Will you be kind enough to reply to this inquiry, either by letter or by answering my question in INDUSTRIAL FINISHING Magazine?—M. A.

We suggest that you try lacquer thinner, brushing it on gently with a small clean soft brush. Try this treatment on only a small surface of the mirror frame at first. Apply enough lacquer thinner to wet the surface and let it soak for a few minutes, if necessary. Of course, lacquer thinner will evaporate rather quickly. Apply more by brushing it on gently. This may soften the gold bronze coating sufficiently to make it come off the gold leaf by continued gentle brushing with the brush wet in clean clear lacquer thinner.

This treatment (gentle brushing with clear lacquer thinner) should not attack nor harm the gold leaf coating, but it should result in complete removal of the gold bronze finish.

If what you use for lacquer thinner doesn't act satisfactorily, try adding a little denatured alcohol to the lacquer thinner—adding up to as much as 20% if necessary. If you are not sure about the quality or composition of the lacquer thinner or solvent you are using, we suggest that you try a half and half mixture of acetone and toluol.

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

If this seems to be too mild, add denatured alcohol as mentioned above.

We presume that you are sure the mirror frame is really coated with genuine gold leaf. You know burnished gold bronze looks somewhat like gold leaf.—ED.

Paint to Change Color With Heat

We are in the market for a type of paint that will change its color upon rising temperature. We are wondering if you would be so kind as to advise us the companies who are in a position to manufacture this type of paint, so that we could obtain complete specifications, showing the changing points in temperature, etc.—M. Mfg. Co.

We had several inquiries along this line about two years ago and published some of the inquiries and what little information we could get on the subject in February, March and April 1941 issues of this magazine. Tear sheets of what we published are being sent to you.

At that time we received a letter from Rogear Co. (Products for Problems) 11 Water St., New York, N. Y., giving us information about

Safe Convoy...

From production line to combat line, Lowe Brothers wartime finishes are providing safe convoy for war weapons and materials of every type against the hazards of exposure, temperature and transport.

Lowe Brothers experience in supplying U. S. Government Specification Finishes, as adopted by all branches of our Armed Forces, can be greatly helpful to you in finishing war weapons or materiel.

Just as Lowe Brothers cooperated to stabilize the color and performance of Machine Tool Finishes, which became the recognized standard of an exacting industry, we will gladly cooperate with you.

So why not benefit by Lowe Brothers experience with industrial finishes for peacetime and wartime products by calling upon us for information regarding application data, thinning ratios, drying schedules, bids or costs on Government Specification Finishes.

Industrial Sales
THE LOWE BROS. CO.
Dayton, Ohio

Lowe Brothers
WARTIME FINISHES for Industry

IN ACCORDANCE WITH U.S. GOVERNMENT SPECIFICATIONS

AND MAINTENANCE PAINTS
TO MULTIPLY YOUR MAN POWER EFFICIENCY

their Efkalin Thermocolors. Some of this is published on page 66 of March 1941 issue of INDUSTRIAL FINISHING. The letter was dated February 6, 1941, and signed by Robert Viegelmann. We are not sure whether this company is in business or whether this is their correct address at the present time.

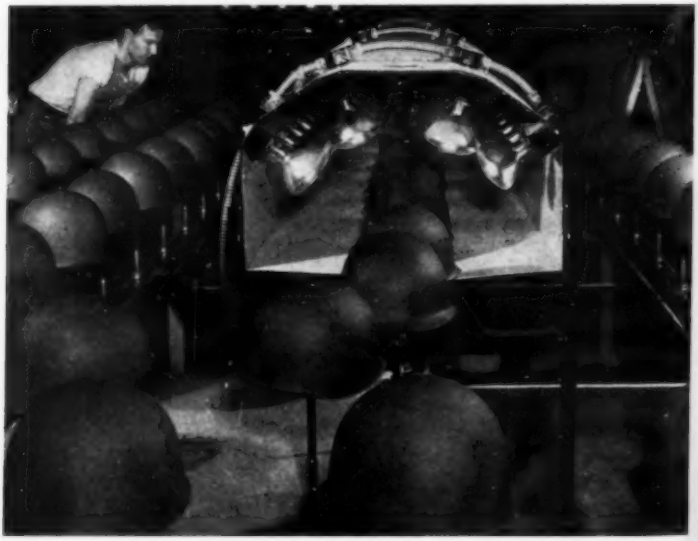
Perhaps some reader can give us further and more uptodate information on this subject. We would like to get it soon.—ED.

Painting and Drying Army Helmets

IN A CERTAIN manufacturing establishment Micarta helmets for the army are painted while on a conveyor which passes through the dryer at a speed of 12-ft. per minute. The infra-red dryer installed is 19-ft. long and the helmets pass through in one minute and 35 seconds.

Spaced 15-in. apart, the hats are dried at the rate of 500 per hour. To obtain uniform drying at 240° F., the hats are rotated slowly on spindles as they move along under four rows of 250-watt, R-40 infra-red lamps with built-in reflectors. The rows, 8½-in. apart, are under an arc-shaped hood of such curvature that the lamps are 4½-in. from the helmets, with the rays at right angles to the painted surface.

After the helmets leave the dryer, they continue on the conveyor for seven minutes after which they are inspected and packed for shipment. In addition, the rapid drying



These plastic liners (to provide comfort and heat insulation when worn inside 2-lb. steel helmets) are dried at the rate of 500 an hour under 4 rows of infra-red lamps.

Remember Pearl Essence for Substitute Metallic Finishes

GUNMETAL
BRONZE
BRASS
NICKEL

THE MEARL CORPORATION

153 WAVERLY PLACE NEW YORK, N. Y.

Factories

ROSELLE, N. J.

EASTPORT, ME.

Priority Rating Is Not Required

Available in Unlimited Quantities

"WORLD'S LARGEST PRODUCER OF PEARL ESSENCE"

WANT NOVELTY?

Then decorate your product with a coat of appropriately colored

FLOCKS

available in any color desired.

COTTON
WOOL OR RAYON
FLOCKS

applied by spray gun or screen process will lend the modern touch to otherwise drab items —and at small cost. Your sales and profits will increase as a result.

Write for samples and color card.

CLAREMONT WASTE MFG. CO.
CLAREMONT, N. H.
The country's leading flock mfrs.

is not of sufficient duration to embrittle the laminated Micarta and cause possible rejects. The power consumption to operate the 112 lamps on a 110-volt line is 28 kilowatts.—WESTINGHOUSE ELECTRIC & MFG. CO.

Reclaiming Waste Synthetics

RECLAIMING synthetics and enamels calls for an entirely different method than what is used for reclaiming lacquers, but it is just as easy. First you need a tank, the size depending upon the amount of sludge collected. At one end of the tank a sausage grinder is fastened, with a hopper above. Inside the tank you place an agitator and a 3-roller mill, with the bottom roller just beyond the blades of the agitator. The accompanying diagram will give you an idea about the relative position of the tank and its accessories.

After the collected sludge has cured for at least one week in a closed drum, it is advisable to warm the drum of sludge in a tank of hot

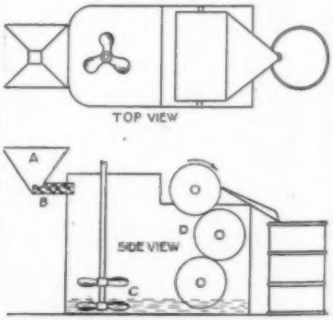


Diagram showing top and side views of the equipment for reclaiming sludge from used synthetic enamel.

FOR VICTORY TODAY AND SOUND BUSINESS TOMORROW

Get This Flag Flying Now!

This War Savings Flag which flies today over companies, large and small, all across the land means *business.* It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are making a definite contribution to Victory . . . by helping to buy guns, tanks, and planes that America and her allies *must* have to win. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity *tomorrow*, keep the War Bond Pay-Roll Savings Plan rolling in *your* firm. Get that flag flying now! For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

SAVE WITH

War Savings Bonds

This Space Is a Contribution to America's All-Out War Program by

INDUSTRIAL FINISHING *Magazine*

SEA-LAC

WAR ORDERS SAIL THROUGH ON TIME

. . . when finished with SEA-LAC Lacquer Enamels and Baking Synthetics manufactured to exacting specifications by experienced industrial finishing engineers.

Get a Duralac quotation before estimating your finishing costs. Write for samples and full information. You, too, will enjoy—

"smooth sailing with SEA-LAC"

Duralac Chemical Corp.
84 Lister Ave. Newark, N. J.

water, bring the temperature up to about 130° F. Open the bung and drain off the water. Then pour the sludge into the hopper *A*. It will feed down by its own weight into sausage grinder *B*. The purpose of the grinder is to divide the sludge into thin threads which will fall into the tank at a point near the agitator. Solvent for the synthetic material must be placed in the bottom of the tank—just enough of it to cover the bottom blade of agitator *C*. This agitator stirs up and mixes the solvent and sludge.

Roller mill *D* will not pick up anything until the solvent and sludge are well mixed. As the solvent and sludge mix, the bottom roller will begin to pick up the material. This material clings to the roller and is automatically transferred to the second roller. When it reaches the right consistency the third roller will pick it up. By placing a horizontal blade to bear against the top roller, this blade will scrape off the enamel and direct the flow-down into a drum, as shown in the diagram. The drum of material obtained in this manner can be stored until called for by the production department.

After the reclaimed enamel has been reduced to suitable viscosity for spraying, it is advisable to carefully strain it through your motor-driven shaker, because minute threads in the material will cause trouble at the gun. The question often arises, where do these thin threads come from? Look at a shaft of sunlight shining through the window. You will notice fine threads floating in the air. They are very small, but consider the cubic feet of air passing through your water-wash spray system every hour and you will get a rough idea of the number of threads col-

YARNALL

INDUSTRIAL FINISHES

Yarnall Production Keyed to Today's Need

—and Yarnall Products are constantly meeting that most essential need—Protection and Longer Life for America's Weapons of War; and keeping America's All Out Victory Program moving steadily ahead . . . . Yarnall Research and Production facilities are always available for the many pressing problems of these times.

Write for our War Finishes Specification Folder

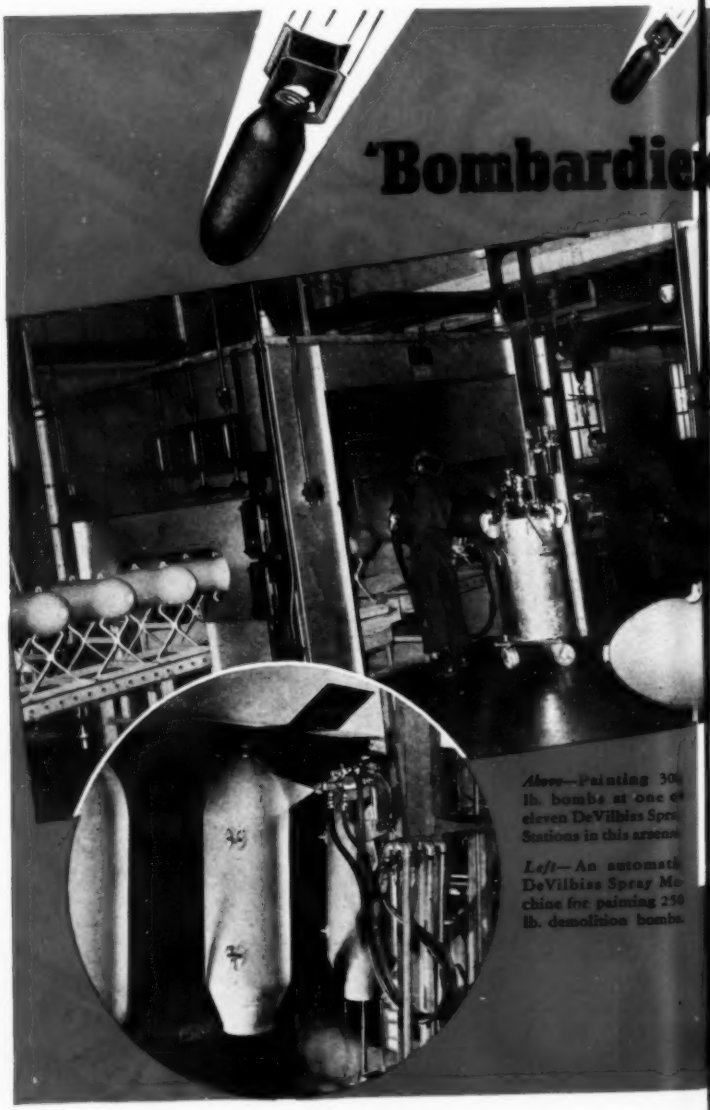
YARNALL

PAINT COMPANY

Industrial Division

Philadelphia

Penna.


'Bombardie
of
SHEL
Above—Painting 30
lb. bombs at one
eleven DeVilbiss Spra
Stations in this arsena
Left—An automati
DeVilbiss Spray Ma
chine for painting 250
lb. demolition bombs.

of the Production Line

. . . DeVILBISS GUNNERS SPRAY MILLIONS OF BOMBS, SHELLS AND BULLETS HEADED FOR HITLER AND HIROHITO

• Millions of bombs must be ready to blast enemy ranks when the full-out American offensive gets rolling. And each one needs protective coatings to prevent corrosion due to chemical reaction and the elements. That's a rush war job that DeVilbiss Spray Systems are doing.

Ammunition of all sizes and shapes—demolition bombs, projectiles, depth charges, shells, grenades, cartridges —are speeded through production by DeVilbiss Equipment. It is used to coat ammunition shells inside and out. Some types spray up to 2000 an hour.

The weapons that use these explosives—guns, tanks, subchasers, planes and battleships—are sprayed by DeVilbiss Equipment, too.

If there's a faster and better way to finish your war product and hurry the day of large-scale American attacks, find out about it now. See what the latest type of DeVilbiss Spray System will do for you.

THE DeVILBISS COMPANY • TOLEDO, OHIO
Canadian Plant: WINDSOR, ONTARIO

DeVILBISS
SPRAY SYSTEMS

R
F
P
RANDOLPH AIRCRAFT FINISHES
FLIGHT PROVEN PLYWOOD FINISHES
1. Plywood Sealer No. 701
(OG for open grain)
(CG for close woods)
2. Plywood Spray Filler No. 710
3. Plywood Glazing Putty No. 780
4. Aircraft Plywood SG Enamel
NEW LOW INFLAMMABLE DOPE
Reduces combustibility 100% or more without sacrificing protection to fabric surface. Full color range, or clear. Also HOT DOPE requiring fewer coats.
INSTRUMENT LACQUERS
set a new standard of perfection for Uniformity, Hardness and Mar-Proofness. May be used directly on metal or over Randolph Zinc Chromate Specification Primer. Available in Clear and Black, the latter made to U. S. Army and Navy specifications.
24 to 48 hour shipment on most items. Immediate quotations. Laboratory reports in a few hours.
RANDOLPH
FINISHING PRODUCTS CO.
Carlstadt New Jersey

lected in your sludge—provided the spray booth has been correctly engineered for your working conditions.

You would naturally question my statement regarding these thin threads clogging the spray gun. The threads are being whirled around and around in the pressure tank and when two or three threads come in contact they are whirled together, making a stronger thread; and on its way toward the gun it passes one or two elbows where it whirls again, entwining more fine threads. By the time it reaches the small orifice of the gun nozzle it has worked itself into a ball perhaps as large as a pea. So you see how important it is to shake your material through a fine mesh screen.—W. BEACHAM.

Colors and Markets

When people go to market to buy colored things they generally fall into one of two groups, according to the Color Research Laboratory of the Eagle Printing Ink Co., Division of General Printing Ink Corp., 100 Sixth Ave., New York, N. Y. The mass of people, with not too educated a taste, will be inclined to act on impulse. For them things must be individually attractive and usually rather bright and elemental in hue. Because their budgets are limited the more inexpensive type of product must stand out and show for its investment.

On the other hand, people with higher income will act less on impulse and more through deliberation. They will not buy things for their individual appeal, but more as items which they will later combine with others. Thus the expensive product will have to fit in with related things. Styling for these people must contemplate general trends in fashion and home decoration and cannot be based on a knowledge of impulse factors alone.

Perhaps the difference is this. People in mass markets are more frank and instinctive in their likes. The primitive hues are the ones they prefer. People in high-fashion markets, on the other hand are more sensitive to conventions and vogues. They want more subtlety and exclusiveness.

★ ★ ★ ★

Specifications + PLUS!

Adaptation of formulae to the individual requirements of busy war contractors.

★ ★ ★

Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.

This PLUS factor is worth considering. We'd like to tell you more about it.

★ ★ ★

THE VARNISH PRODUCTS COMPANY

CLEVELAND, OHIO

★ ★ ★

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

•

Published the 18th of each month by PRACTICAL PUBLICATIONS, Inc.
1142 N. Meridian St., Indianapolis, Ind.
Telephone.....Riley 6771

•

President and Editor.....W. H. Rohr
Vice Pres. and Adv.-Mgr.....E. A. Dosch
Secretary-Treasurer.....R. E. Suits

•

Subscription Rates Per Year
U. S. and Possessions.....$2.00
Canada and Foreign Countries.....$3.00
(No subscription solicitors are employed)

Editorial

War Painting More Likely to Start Fires

A note of warning has been called to our attention in reference to the increased fire hazards of some of the new army paints which are now being used so extensively in factories doing war work. Several establishments using these materials have had small fires caused by spontaneous combustion.

Fortunately every fire is a small fire at the beginning, but a small fire in a painting department will spread rapidly unless it is brought under control immediately and extinguished promptly. Unfortunately a few of these painting department fires got beyond control and resulted in the loss of thousands of dollars worth of buildings, equipment, materials and supplies, as well as causing a serious loss of production pending the rebuilding and re-equipping of the plants.

It is our understanding that the materials most likely to cause this serious trouble are the quick-drying dull finishes, such as are used on vehicles of all kinds. For those who use the dry type of exhaust system at spray booths, there seems to be no way to prevent spontaneous combustion, even when the booths are cleaned twice a day and when a continuous vigilance is kept by all who work in the vicinity. Even when a water booth is being used, there is some possibility of an accumulation of overspray igniting in the section ahead of the water tank, although most of the trouble, we understand, has been within the exhaust stack. Where water booths are used, little or no paint gets into the stack, so the fire hazard is there at a minimum.

From the information at hand, we would advise those who use dry exhaust systems to double the extinquisher equipment for immediate use near the booth as well as to double check it for effectiveness and reliability.

With a maximum war production so vitally important to the entire nation—particularly to our boys and girls in the service, sacrificing everything for their country—we

at home must do whatever is possible to prevent and control fires. Our first defense is fire prevention; second, fire control. Let's see to it that a fire can't start. Let's see to it that if or when a fire does start, we have everything needed (and have it where it should be) to check that fire, control it and extinguish it promptly—night or day, work day or holiday.

Heroes at Home Back Up Heroes Over There

★ Alarm clocks are ringing every hour, day and night. Men and women are going to and coming from work. Streets in town are no longer quiet in the small hours of the morning. Men and women are passing hurriedly to and fro. Their job is to work in the defense plants and see to it that their jobs are done well and as fast as possible, without too many rejections from the inspector. The fewer the rejections, the greater the volume and speed of production of what is needed urgently by our boys at the front.

Let's not forget that the heroes are not all at the front. A man or woman in the factory can also be a hero by doing his bit, plus something more added. For example, aiding the person next to him. If that person happens to be new at the job, a little encouragement and a little guidance over rough places will mean, oh so much. It will help in many ways, just as a hero at the front helps his wounded comrade.

The man at the front has no time for headaches or little tired feelings. He has to go on and carry his full kit, while exposed to great danger and hardship. All we defense workers have to do is to carry our lunch boxes. So let's not stop for trifles. Let's keep going and put in a full day's work every day, knowing all the time that the more we help now the sooner this war will end.

Let's keep those alarm clocks ringing and keep every man and woman on the job until we can ring that old cracked Liberty Bell again and let the whole world know that there is a last liberty for all.—E. M. STEPHENSON.

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

Substitutes; Savings; Compregnated Wood

★ The protective coatings industry and all allied branches have done, and are doing, a commendable job in the war effort—and they will continue to do so. Willing sacrifices will be made today and in the future.

Because of our material riches we have become the most wasteful nation in the world. Less favored countries looked at us askance and bought up our waste products in large amounts. It was only a few years ago that a boatload of scrap iron, loaded at New York or Boston, commanded a higher price on the docks of a German port than in Pittsburgh. Our discarded automobile tires were used to make shoes for people in Italy and Spain and we could afford to fill large areas with discarded automobiles and imperfect refrigerators.

Torpedo Squadron 8 will live Forever

THERE'S NO TIME TO LOSE—THERE'S JUST TIME TO WIN!

- INSTRUMENT BOXES
- AIRPLANES
- GUN STOCKS
- BOMB SIGHT BOXES
- TOOL CHESTS
- MARINE PARTITIONS
- RADIO INDUSTRY, ETC.
- SKIIS

ENSIGN GEORGE H. GAY, U. S. N., is the sole survivor among thirty men in fifteen planes of Torpedo Squadron 8 who carried out their mission in the battle of Midway. Ensign Gay succeeded in torpedoing a Jap carrier, he was wounded, shot down and rescued the following day by a patrol boat.

All of us on the production front must go all out to keep our gallant fighting men properly supplied and equipped. There is no effort nor sacrifice too great for us to make for them.

Our production facilities are devoted to the manufacture of government specification protective coatings. Listed here are just a few of the war products now being coated with our materials.

Phone, wire or write and let one of our finishing experts help you "keep production rolling."

THE LAWRENCE-McFADDEN CO.

Headquarters for Fine Finishes Since 1875

7430 STATE ROAD PHILADELPHIA, PA.

While we are the arsenal for raw materials necessary to conduct our total global war, we suddenly discovered that we didn't possess a bottomless well of raw materials, therefore we found it necessary to inaugurate a measure of conservation of all raw materials essential to carry out our war program. Scrap iron, steel, aluminum, rubber, etc., are of vital importance in our arms, ship and tank program and it therefore remains for American ingenuity to dig into our vast material resources and develop substitutes.

Wood, which has served mankind from early times, is again coming into its own. We are blessed with an abundant supply in our forests; it is relatively cheap, can be machined quite easily and is strong for its weight "with the grain." (The tensile strength of wood, using a weight-for-weight factor, is greater than that of structural steel; however, its tensile strength "across the grain" is quite low.) It has its shortcomings, however, when we consider its functional use as a replacement in part or entirely for critical metals. It is absorbent, supports combustion, is easily ruptured, is not uniform, and cannot be predicted as to its performance.

The shortcomings just mentioned are largely overcome in a product known as "compregnated wood," thus making available a substitute for critical metals that surpasses the scarce materials which it replaces. Wood therefore challenges the metals.

One of the outstanding developments of this war is the expansion of the use of plastic plywood in aircraft construction. This structural combination is comparatively low in cost, possesses excellent mechanical stability and a degree of surface smoothness which makes for first-rate aerodynamic qualities. The superstructure of patrol torpedo boats is likewise constructed of plastic plywood. The furniture industry is the source of supply for most of the manufactured wood parts used in plane and torpedo boat construction and is therefore an important arm of these industries.

In this writer's opinion, compregnated plywood—that is layers of wood that have been impregnated with plastic resinous compounds under pressures up to 1500-lbs. per square inch—holds the answer to many of our problems which involve such critical materials as metals. This product will lay the foundation for a brand new American industry.—RAY C. MARTIN.

Avoid What Causes Fires in Finishing Rooms

* Going up a factory stairs the other day I noticed, on each landing, a pail half full of sand. By their appearance you would think those pails of sand were trash containers. Cigarette butts, paper cups, old lunch papers and other inflammable materials had been tossed into each pail. Why not see that in your factory the waste materials are cleared from these sand pails and the pails are really filled with sand, which is what they are intended to contain—for possible fire fighting.

Look out for those oily rags and those nails that stick up above the floor in the finishing room. Do not enter a finishing room with nails or steel plates exposed on the soles of your shoes. Do not pick up that stray nail and throw it carelessly into the spray booth—perhaps into a whirling exhaust fan. This is what often starts fires, which mean waste of man-power and of essential products that may be ready for shipment. Even small fires cause delay and inconvenience.

See that all containers of paint, lacquer and thinner or solvents are covered before leaving your finishing room. Solvents in open cans and finishing materials left uncovered evaporate, thus causing a needless wastage of materials, many of which are hard to obtain. It is good policy and also patriotic to save when and wherever you can. —E. M. STEPHENSON.

Blanchit
Reg. U. S. Pat. Off.
WOOD BLEACH
Now of special value to fabricators of Housing employing plywood panel wall interiors.
L. R. van ALLEN COMPANY
(Pat. Licensee)
406 N. Wells St. Chicago

Write for FREE COLOR CARD
STICK SHELLAC
Unequalled for repairing damage to varnish, enameled or lacquered finish. Made in transparent and all wood and marble colors in both standard and lacquer grades.
M. L. Campbell Co.
706 East 19th St. Kansas City, Mo.

★ ★ ★ ★
FLOCK
Four Star Finish
★ ★ ★ ★
★ Sound Deadening ★
★ Temperature Insulation ★
★ Soft Finish ★
★ Ready Availability ★
Try "KINGCOTE" Styles
★ "RAYCOTE" ★
★ ★
★ ★
★ By ★
RAYON PROCESSING CO. OF R. I.
865 TREMONT ST. CENTRAL FALLS, R. I.

For interior and exterior painting of surfaces beyond ordinary reach.
CROWN
EXTENSION GUN

Used in many war plants for truss work, girders, roof work.
This self-contained unit costs less and has all the features of the best production guns including full trigger control.
Special model for camouflage paints, emulsified asphaltum & fibre coat.
Lengths 4 ft., 6 ft., 8 ft.
CROWN SPRAY GUN MFG. CO.
1218 Venice Blvd., Los Angeles, Calif.
Warehouses in Principal Cities

Changing Conditions; Problems

In war, conditions change and change quickly. Scarcity of products requires shifting to others as well as the more effective and efficient use of the diminishing ones.

Plant outputs may be completely assigned, but it is reasonably possible that new developments might make it essential that some of that future production be consigned to other destinations. It is the constantly changing picture that offers problems that must be met by the protective coatings industry, and it is only through planning and contact that ways and means may be devised to cope with any emergency.

Fighting Fires in Confined Spaces

Fire Prevention Week, which was observed October 4 to 10, served as a reminder that now is the time for improving fire defenses and teaching fire-fighting forces new methods, wherever this is possible.

This year, the fire brigades of many businesses and industries might profitably be given special instruction in an important, but often overlooked, problem—that of fighting fires in confined spaces, such as basements, cellars, pits, manholes, vaults, and small compartments generally.

The important feature of this problem is that it involves life-hazards that exist to a far less degree with fires in places where there is ample ventilation.

These hazards originate in the fire itself, and go beyond the heat and flame. Every fire, especially when burning where the ventilation is poor, generates large vol-

Government Specification Protective Coatings

ENAMELS
BAKING ENAMELS
LACQUERS
SEALERS
PRIMERS
SYNTHETICS
VARNISHES
SHELLAC
FILLERS—STAINS
FINISHING SUPPLIES

Our complete line of G. S. P. C. finishes has been specially formulated to meet the rigid requirements of government specifications. Manufacturers who are prime contractors or sub-contractors on government work are invited to send for samples and prices of our G. S. P. C. finishes.

A quarter of a century of constant research and product development finds us well prepared to produce and deliver promptly our G. S. P. C. finishes.

Use our laboratory, technical staff and production experts for consultation, without obligation. Write today.

G.S.P.C. PRODUCTION FINISHES

NEW YORK WOODFINISHERS' SUPPLY CO., INC.
109 IMLAY STREET BROOKLYN, N. Y.
Established 1917

umes of the deadly carbon monoxide, and, frequently, other gases, such as hydrogen sulphide and hydrogen cyanide, which are even more poisonous. In consequence, it is always dangerous to breathe smoke and fire gases, and special care must be taken to avoid this danger when the fire is in a confined space.

In fighting fire in a confined space, therefore, the following rules should always be observed:

1) Fight the fire from outside the space wherever possible, standing where there is fresh air and discharging the extinguishing agent on the fire through a doorway or other opening.

2) After the fire is out, do not enter the space without respiratory protection until it has been thoroughly ventilated. Some spaces, such as manholes, may have to be ventilated mechanically before they are safe to enter.

3) If a small unventilated space must be entered when a fire is burning in it, or immediately after the fire is extinguished, gas masks must be worn. The "all-service" type of mask, which protects against carbon monoxide as well as other fire gases, may be worn when the atmosphere of the space is known to contain enough air to support life; but, if there is reason to believe that the atmosphere is deficient in oxygen, some type of oxygen breathing equipment must be used.

It is important that these facts be memorized so that one will be in position to cope effectively with emergencies when they arise.—SAFETY RESEARCH INSTITUTE.

NOROY

SHELLAC BLENDER

NOROY

Converts One Gallon Into Four Gallons

- Blends in equal parts with pure 4 lb. cut shellac.
- This blend can be cut with an equal part of alcohol.
- Produces a high water resistant finish. Does not turn white.

Order a one gallon trial can of NOROY SHELLAC BLENDER at drum price for your own production test.

UNIFORMITY • QUALITY • PERFORMANCE

RUDLACO

RUDD LACQUER CORPORATION

127 MAIDEN LANE, NEW YORK

Factory—Rahway, N. J.

What "pH" Is

AN ARBITRARY symbol, "pH" is used by the chemist to denote a factor that affects practically every chemical reaction where water and acids, alkalis or salts are present.

In simple language, *the pH is an indication of the degree of acidity or alkalinity of a solution.* pH values do not indicate the amount of acid or alkali present. A solution may have a large amount of some acids—for example, boric acid—yet show a pH value much nearer the neutral point than a solution having only a trace of strong acid like hydrochloric. The amount of acid or alkali present is determined by titration. *The intensity with which the acid or alkali will react, irrespective of the amount present, is indicated by the pH value.* pH may be a determining factor in such things as the completeness of precipitation in an analytical procedure, the dyeing of a fabric, the yield of a chemical process, the quality of a product made by a chemical process, the efficiency with which a chemical product serves the purpose intended.

Once the optimum pH for a given purpose is determined by experiment, a pH testing outfit makes it possible to reproduce this pH in a routine way and thereby consistently reproduce the desired result. For example, a fabric can be dyed in a certain dye having solutions of pH 8, 8.5, 9.0, 9.5 and 10.0. Experiments might show the pH of 8.5 gives best results; the pH of the solution could therefore be maintained at that point, with

marked increase in the efficiency of the dyeing operation. The same technique can be applied to any chemical problem involving pH.

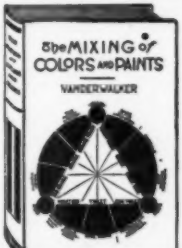
The pH scale extends from 1 to 14. pH 7 is the "neutral" or transition point. Below 7 the values are increasingly acid; above 7 increasingly alkaline. The scale is logarithmic, therefore each unit indicates 10 times the hydrogen ion concentration of the preceding unit. Thus pH 5 is 10 times, and pH 4 is 100 times as strongly acid as pH 6; likewise pH 9 is 10 times and pH 10 is 100 times as strongly alkaline as pH 8.

A buffer is a substance, usually containing a salt, that shows resistance to a change of pH on the addition of an acid or alkali. For example, one drop of hydrochloric acid added to a liter of distilled water makes a solution having a low (strongly acid) pH value because the solution is not buffered. But if the drop of hydrochloric acid is added to a liter of water in which are already dissolved substances such as borates, citrates, phosphates or other salts, then, because of the buffering action of these substances, the addition of the hydrochloric makes only a slight shift of pH toward the acid side. Since a buffer is a solution having a rather stable pH value, the term "buffer" is also commonly applied to solutions of known pH.

Prepared solutions of known pH value bring out, right on the test paper, that paper's color for any pH value. When making a test, place a drop of the sample on the test paper and compare the color with the color chart furnished with the test paper. Then select one of these known pH solutions close to the pH value indicated by the first test and place a drop of this known

SPRAY EQUIPMENT
Pontoon bridge parts being sprayed at Lord & Burnham. For information on spray equipment — manually or automatically operated, write for our catalog No. 80.
ECLIPSE AIR BRUSH CO.
392 Park Ave.
NEWARK, N. J.

GET THIS BOOK!

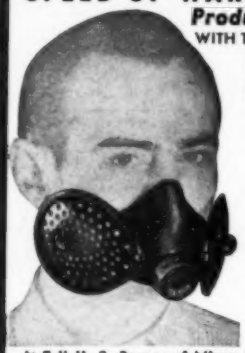


COLOR formulas and Useful Color Cards. Description. Properties. Theory. Harmony and Management of Colors. Furniture and Polychrome Finishing. Color and Light; Description of Color Pigments; Properties of Color Pigments; How Colors Are Prepared for the Trade; Basic Paint Pigments; Painting Oils; Volatile Thinners and Dryers; General Paint Mixing Methods; Color Theory, Principles and Use; Colored Paint Mixing, Methods; Mixing Special Purpose Materials; Color Harmony and Management; Selecting Color Schemes.

296 Pages, Fully Illustrated with Color Chart and Drawings. Cloth. Price **$2.00**

INDUSTRIAL FINISHING
1142 N. Meridian St. Indianapolis, Ind.

SPEED UP WARTIME
Production!
WITH THIS NEW
Cesco
No. 94
RESPIRATOR



★ Full U. S. Bureau of Mines Approval (No. BM-2142) against Type A (Silica), Lead and Nuisance Dusts. Equip your workers with this new COMFORTABLE and SAFE Respirator for FASTER DEFENSE PRODUCTION. It's the "Cesco No. 94." Write.

Chicago Eye Shield Co.
2367 Warren Blvd. Chicago, Ill.

SAVE 50% ON STAINS
Mix your own liquid stains from Campbell Dry Stains. We have a type suitable for any purpose. 2 to 5 oz. makes a gallon. Any stain on market easily duplicated. To prove it, send us sample of stain you are using. We'll show you how to make it—at a big saving.
M. L. CAMPBELL CO.
706 East 19th Street Kansas City, Mo.

LONGMAN'S
SEAL LAC
★ More durable than shellac.
★ Guaranteed waterproof.
★ Thins similar to 5-lb. cut shellac with Benzine, Turpe or Mineral Spirits.
★ Dries in three hours.
Send for working sample.
LONGMAN & MARTINEZ, Inc.
46 Roebling Street BROOKLYN, NEW YORK

solution on the test paper beside a drop of the sample. When differences in color are scarcely perceptible, dip a strip of test paper in the solution, let drain and note the color at lower end of the strip, observing it against the back of the hand. With two or more such colors for reference, the pH of the sample can be quickly judged to about 0.5 pH unit.

The advantage of this procedure is that the reference colors produced on the wet test paper duplicate the hue and intensity of the color produced by the sample. The color difference for any half-unit interval can be observed. This procedure also compensates for any difference in the test papers due to aging, variations in processing, or different batches of dyes.—R. P. CARGILLE.

Stenciling War Products

BY DESCRIBING my shop headaches and how I cured them—this may help others who are trying to speed up war production.

Some time ago I gave some attention to speeding up a stenciling operation on practice bombs. To keep up with production five spray guns were being used—plus four girls to carry bombs to the sprayers, four to take them away and one girl to wash stencils, making a total of 14 girls.

I had a rough 2x4 stand made. On top of this stand I placed a rubber stamp which had raised letters the same size and design as those being sprayed on the bombs. A stop was fastened at one edge for the bomb fin to fit against, so that each bomb would be in the same position while being stenciled.

To ink the raised letters of the

I. C. D. FORMULA NINE
NON-INFLAMMABLE
« wax free REMOVER »
for paint, varnish, lacquer, baked enamel, adhesives
EASY TO APPLY—NO AFTER-CLEANING

PROMPT DELIVERIES

I. C. D. FORMULA 9 is the standard of safety and quality . . can be sprayed or brushed . . doesn't raise grain nor discolor . . quickly removes all kinds of finishes and coatings . . costs less to use . . saves time, labor and material.

SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

INDUSTRIAL CHEMICAL DEVELOPMENT CORP.
111 MADISON AVE. NEW YORK, N. Y.

rubber stamp I used an ink roller to pick up ink from an inked steel plate. Then, by rolling each bomb over the inked stamp (positioned face up on the table) and onto the conveyor, I reduced the number of girls required for this work from 14 to 3. One girl took bombs off the conveyor and rolled them over the rubber stamp and one inked the stamp.

I mixed the ink with dibutyl phthylate, with the result that the ink would not dry on the steel inking plate or rubber roller, but it would dry in less than one minute on the lacquered surface of a bomb.

Following this job we obtained one which called for a metal fin crate, with olive drab finish, to be stenciled black. The ink used on the bombs would not dry on the olive drab enamel finish. I asked a large printing ink manufacturer to make up an ink with a varnish base which, when cut with benzyl cellulose, would dry on enamel in a matter of seconds, although it would not dry on lacquer.

I made a frame on four springs and placed my rubber stamp underneath but face up on a 2-in. thickness of sponge rubber. Then, by placing the crate over the frame and pressing down, the crate made contact with the rubber stamp. This resulted in printing each crate in exactly the same position as the one before. The 2-in. cushion allowed the stamp to give, which took care of any bend or warp in the steel, the lettering was always clear, clean cut and in proper alignment.

Clear clean lettering in this kind of work is a matter of considerable importance. With the lettering, say ⅜-in. high and stenciled with a brush at present production speed,

MARTIN VARNISH CO.
900 West 49th Place · Chicago
• LACQUERS
• ENAMELS
• VARNISHES
• SYNTHETICS
SPECIALISTS IN SPECIFICATION FINISHES

Try HY-POWER WOOD BLEACH
Bleaching operation SIMPLIFIED. By mixture of two liquids, one application gets results usually achieved by two. FREE—Write for booklet and full information on bleaches.
M. L. CAMPBELL CO.
706 East 19th Street Kansas City, Mo.

the words "with detonator", if blurred could be read "without detonator", and we might lose several good American boys.

If you are unable to obtain rubber stamps, a very good substitute can be made by mixing glue, gelatine and glycerine in a double boiler and pouring, while hot, into a die. By cutting down a little on the portion of glue used, the 2-in. cushion can also be made by this formula.—W. BEACHAM.

Paint Brushes

THERE NEVER has been any such thing as a "camel's hair brush"! This type of brush is generally made from squirrel's hair. Camel's hair would actually make a very mediocre brush.

Most "sable hair" brushes, so named because of their softness and fineness, are actually made from Russian "kolinsky," although skunk hair is also used. Sable, in itself, would make a poor brush.

Hair for brushes is obtained from bears, badgers, goats, oxen, civet cats, horses, and cattle.

What is known as "fitch" is nothing but common skunk!

Hog bristle, which has now been frozen for use only in the war industries, makes the very finest paint brushes. Man has never been able to duplicate the amazing bristle of a hog. Hog bristles have two to 12 "flags" at the tips, which hold and evenly spread the paint. As the brush wears down, the "flags" travel down the bristle, always sub-dividing as they were when the brush was new.

Eleven different lengths of bristle are used in the construction of a good paint brush.

Beneath the heavy coating of bristles on bristle-bearing hogs is a fine layer of hair, known as wool, which is also valuable in the manufacture of certain types of brushes.

Hog bristles look straight, but they're far from it! But it's all the better! Their slight curvature is an important part in the construction of a really good brush.

Because of the enormous layer of fat below the bristle-bearing hog's skin, the animal may attack and eat poisonous snakes with no ill effects. The surplus fat absorbs the poison from the snake bite!

Unusual materials from which brushes are made include nylon, rice root, bamboo, rubber, hair from the inner side of an Ox's ear, and plain ordinary grass.

All types of wood are used in the

manufacture of blocks and handles for brushes, but most bristle brushes are set in rubber, synthetics, plastics and pitch.

Most of the reddish brown bristles come from India; gray ones come from Russia, and white ones from Poland and France. While most of the Chinese bristles are black, China produces virtually all colors of bristles.

Brushes for fine oil painting have been made from a single rat whisker!—G. O. BOWLAND, Brush Div., Osborn Mfg. Co.

In spray-painting, "speed-reducers" are extra-stroke men whose guns are chronically out of adjustment, requiring an unnecessary shot at the target moving by on the production line. Other offenders against the production pace are the "rhythm makers"—operators who work too fast, apparently feeling that once they get going the gun, wide open, must be kept swinging. Orderly, systematic procedure in slow careful strokes is faster in the end, experts emphasize. Meanwhile "arcing," "whipping," and non-specialization in touch-up work must be avoided to maintain speed.

General Printing Ink Corp. Personnel

Mr. John F. Devine, who was advanced to Operating Vice President of General Printing Ink Corp., will continue as General Manager of The Fuchs and Lang Mfg. Co. Division.

Mr. Robert J. Butler, as General Sales Manager, will remain in active charge of sales throughout the United States. "Bob" Butler, as he is known to the lithographic industry, has been in charge of sales for the past year. His background of 22 years experience includes technical laboratory research and service sales work, as well as lecturing on the subject of lithographic inks to litho organizations all over the country. Last year he was chairman of the Litho Clinic sponsored by the Lithographers National Association at Greenbrier.

Pulmosan R-151 Chemical Respirator

High Safety — Low Service Cost

The R-151 Respirator has an outer dust filter which protects chemical cartridge against clogging. Simply replace inexpensive dust filter — get longer service from cartridges, keep down breathing resistance. Write for details and prices.

PULMOSAN SAFETY EQUIP. CORPORATION

Dept. IF, 176 Johnson St., Brooklyn, New York

Practical Furniture Finishing

The Most Complete Handbook On Finishing Fine Woods Ever Written

Tells EVERYTHING you need to know about Wood Finishing. Includes types of unfinished furniture, choice of finishes, brushes, accessories, precautions, natural finishes, staining, filling and bleaching, varnish, enamel or paint finishes, finishing with a spray gun and many other fascinating practical subjects. Also includes complete section on furniture repairing and refinishing. Four pages of 32 different foreign and domestic woods illustrated in natural colors. 112 pages fully illustrated.

CLOTH, POSTPAID.....$1.25

INDUSTRIAL FINISHING

1142 N. Meridian St. Indianapolis, Ind.

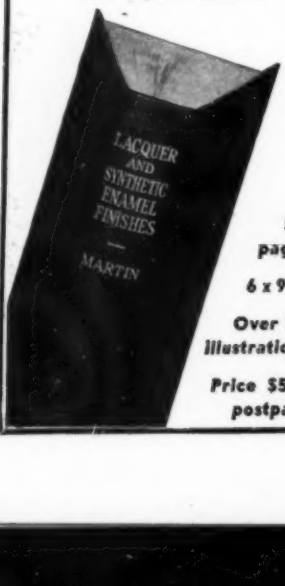
LACQUER and SYNTHETIC ENAMEL FINISHES

By Ray C. Martin

The author takes up the raw materials that enter into the manufacture of these important finishes and includes laboratory formulations and testing, manufacturing methods, requirements of many types of finishes for various industries and products, methods of analysis, methods of applying finishing materials, chapters on furniture finishing and automotive finishing, a glossary of terms used in the industry with clear explanations of what they mean, and an alphabetical index of subjects covered in the book. Price $5.50 postpaid; cash with order.

Order from

Industrial Finishing
1142 N. Meridian St.
Indianapolis, Indiana



526 pages.

6 x 9-in.

Over 100 illustrations.

Price $5.50 postpaid.

Cleaning Inside Corners

THERE are corners and hard-to-get-at places on a great number of products which are very difficult to clean up properly for the finishing processes to follow. Giving proper attention to these very places, however, often means the difference between a satisfactory and an unsatisfactory product. There are some places where a wheel can be used. It is interesting to know that abrasive wheels for cleaning—having the abrasive bonded into a resilient rubber backing—may be had for use on lathes and portable spindles for handling such work.

The same type of abrasive is available in the form of tablets, sticks, rods and special shapes, so that the material may be had in a form to get at any conceivable type of product to the very best advantage.

Becomes General Manager of Detroit Rex

To further streamline its war program, the Detroit Rex Products Co., Detroit, Mich., has appointed A. O. Thalacker as General Manager. Mr. Thalacker has been a company executive for the last five years and lately has been Secretary, a position he retains in addition to his new responsibility.

Mr. Thalacker is 35 years of age, and is a graduate of the University of Wisconsin.

The metal cleaning process in which the Detroit Rex Products Co. is now

principally interested was not in existence during World War I. Now it represents a major industry and a vital production operation in nearly all war plants working in metals. Recognition of the importance of the process has resulted in a quadrupling of the company's business in the last 18 months. All this business carries a high priority rating.

Airplane Spray Booth Bulletin

A 4-page bulletin in two colors illustrates and describes Mahon hydrofilter spray booths, explains how they are adaptable to factories making different products, and finally describes and illustrates a booth designed especially for painting an entire airplane after complete assembly. A free copy of this book can be obtained by writing The R. C. Mahon Co., Detroit, Mich.

Letters from I. F. Readers

(Continued from page 8)

Service Shop, under the caption, "Photo Finishes". Please furnish us with the address of this company as we believe we have what they are looking for.—The Meyercord Co.

Name and address supplied.—ED.

Light Oak Putty; Rubbing Varnish

Where could I get putty in light oak for filling holes in furniture? Also, a good rubbing varnish? Please send me some back copies of INDUSTRIAL FINISHING.—A. M.

Used Water-Wash Booth

We are interested in locating a used water-wash spray booth with 42-in. 5-hp. exhaust fan and a 5-hp. water pump to operate against a 40-ft. heat, approximately 220-gpm.

Will you please put us in touch with anyone who might have equipment of this nature for sale? The above specifications are rather flexible. We believe that we could adapt equipment that would come somewhere within this capacity.

We will appreciate any information you can furnish at the earliest possible date. We probably could construct the booth, providing we could secure the pump, fan and motors.—K. M. Co. (Fixture Mfg. Co.).

Classified Advertising

Rate: 45 cents per line per insertion—minimum $1.35

FINISH FORMULATOR WANTED.

Laboratory man experienced in formulation of industrial finishes. Give experience, selective service status, and salary expected. Location: Connecticut. Address IF-905, care Industrial Finishing.

WANTED.

An experienced formulator of industrial finishes—one who is thoroughly familiar with the development of industrial enamels and paints, including all types of synthetic, lacquer and oil coatings. In reply, please state experience, present connection and other pertinent information. Address IF-907, care Industrial Finishing.

WANTED.

One laboratory size spray booth. State size, condition, price and location. Address IF-904, care Industrial Finishing.

WE BUY DIRTY SOLVENTS.

Don't throw away spent cleaning thinner, degreaser residues, etc. Send us a sample for quotations. We also reclaim for customers. DYTEX CHEMICAL CO., 267 Plain, Providence, R. I.

SALESMEN FOR INDUSTRIAL FINISHES WANTED BY

One of the oldest paint, varnish and lacquer manufacturers having complete line of all types industrial finishes. Can offer attractive proposition to qualified salesmen for the territories in Eastern Pennsylvania, Connecticut, and New York. State qualifications and previous experience. Replies held strictly confidential. Address IF-906, care Industrial Finishing.

Index to Advertisers

Advance Paint Co. ..... Front Cover
Arco Company, The 51
Ault & Wiborg Corp. 69

Berry Brothers 67
Binks Mfg. Co. 34-35

Campbell Co., M. L. 93-98-100
Chicago Eye Shield Co. 98
Claremont Waste Mfg. Co. 82
Classified Advertising 103
Crown Spray Gun Mfg. Co. 94

Day & Co., James B. 77
Despatch Oven Co. 59
Detroit Surfacing Machine Co. 1
DeVilbiss Co., The 86-87
Dolan & Co., V. J. 5
duPont deNemours & Co., E. I. 52-53
Duralac Chemical Corp. 84

Eclipse Air Brush Co. 97
Egyptian Lacquer Mfg. Co. 49

Glidden Co., The 73

Hilo Varnish Corp. 65

Industrial Chemical Development Corp. 99

Johnson & Son, Inc., S. C. 33

Koch Sons, Inc., George 54

Lawrence-McFadden Co. 92
Lilly Varnish Co. 10-11
Longman & Martinez, Inc. 98
Lowe Brothers Co. 79

Mahon Co., The R. C. 36
Martin Varnish Co. 100
Mearl Corp., The 81
Meyercord Co., The 7
Mixing Equipment Co. 8
Murphy Varnish Co. 43

Nason & Co., R. N. 61
New York Woodfinishers Supply Co. 95

Paasche Airbrush Co. 41
Pittsburgh Plate Glass Co. 46-47
Pulmosan Safety Equipment Corp. 101

Randolph Finishing Products Co. 83
Rayon Processing Co. 94
Reliance Varnish Co. ..... Third Cover
Rockford Varnish Co. 71
Roxalin Flexible Finishes, Inc. ..... Second Cover
Rudd Lacquer Corp. 96

Southern Varnish Corp. ..... Back Cover
Sterling Tool Products Co. 5
Stille-Young Corp. 9

United Lacquer Mfg. Co. 6

vanAllen Company, L. R. 93
Varnish Products Co. 89
Vol-U-Meter Co. 6

Walker & Co., H. V. 57
Watson-Standard Co. 75
Wilson-Imperial Co. 29
Wipe-On Corp. 63

Yarnall Paint Co. 85

Zapon Division—Atlas Powder Co. 2

Advertising

Reading a number of trade magazines, I notice that some familiar firm names are not among the advertisers. Can it be that these firms believe they do not have to advertise because their business is good now and because of war work? Another day is coming. Later on, when salesmen for these firms go out to introduce their goods to the trade, the new buyers or superintendents will probably look up in surprise and say:

"Why, I never heard of your firm. Have they been in business long, or did they start during the war? Beg your pardon, what did you say your firm makes?"

Fighting words, those, but the salesman will have to take it and pretend to like it. He must be tactful and patient. It will be uphill work for the new salesman because he will find his work like selling for a new firm just starting out.

There are going to be many mistakes made during these war times; cutting out advertising and not calling on old customers are just two of the mistakes we should avoid. Good business sense and common courtesy tell us to call on the firms that have bought goods from us in the past. We should let them know that we are hoping we can serve them with our new materials for their possible new needs.

Large buyers are not the only ones who deserve our attention. Calling on the smaller concerns also leaves a good impression and makes for better business both for now and after the war is ended.—E. M. Stephenson.

These RELIANCE Finishes will help speed up WAR PRODUCTION!

DESKS - FILES - CHAIRS

o. 8383 Olive Green Stain
o. 8381 Olive Green Filler
o. 165 Sealer
o. 757 Gloss Le-Tis-Lac

Meets Air Corps specifications for Olive Green office chairs.

o. 847 Green Lacquer Stain Filler
o. 8367 Green Lacquer Primer
o. 8129 Green Wet Proof Enamel

Meets Air Corps specifications for filing cabinets, desks and office equipment.

LOCKERS - CABINETS - BEDS

pec. 63B Neutral Gray Primer Sealer
pec. 63B Olive Drab Gloss Enamel

Meets Q. M. Corps specification 63B for bunk beds.

o. 165 Sealer
o. 7985 Olive Green Primer
o. 8294-2 Olive Green Enamel

Meets Navy specifications for lockers and bunk beds.

o. 8377 Olive Drab Primer
o. 8764 Olive Drab Enamel, Color 22
o. 8316 Olive Drab Enamel, Color 8

Meets Air Corps specifications for cabinets and lockers.

TRAILERS-TRUCK-ORDNANCE

o. 407 Toxic Preserver
o. 8110 Gray Refinishing Primer
o. 8922 Rust Inhibitive Primer
o. 8923 Lacquer O. D. Enamel

Meets Q. M. specification 15-680 for trucks, trailers and mobile equipment.

These materials have been officially tested and approved.

end us samples of the wood you intend to use; mention which specification you must meet and whether you prefer lacquer or varnish; we will send you full details, samples nd prices, WITHOUT OBLIGATION.

RELIANCE VARNISH COMPANY, INC., LOUISVILLE, KY.

SURFACE RAIDERS

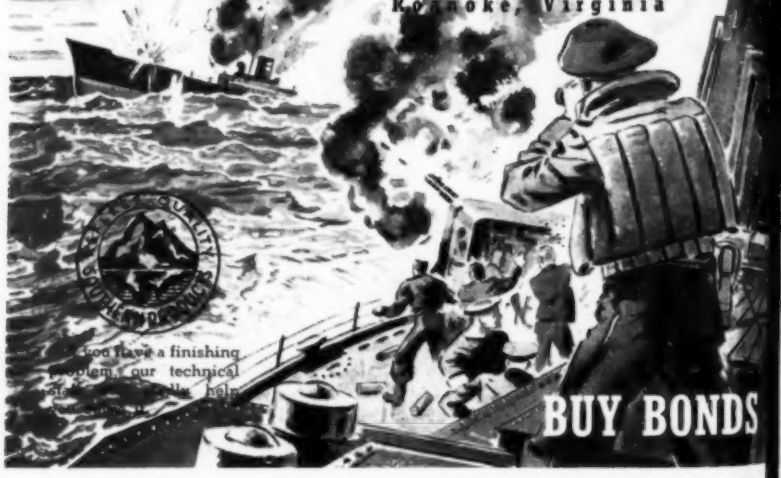
Industrial products, as well as ships, face the peril of *surface raiders*. But it's much easier to protect the products of industry . . . for Southern Varnish Corporation finishes, do the job thoroughly, economically. Produced with scientific precision to amply fulfil specialized industrial needs, Southern Varnish Corporation finishes are unsurpassed in uniformity, durability, and aesthetic appeal.

SYNTHETONE
LACQUERS
VARNISHES
SYNTHETIC FILLERS
SOVATONE STAINS (NGR)
PAINTS - ENAMELS
WIPE-RITE STAINS
SPRAY-RITE STAINS
SPECIFICATION FINISHES

SOUTHERN

VARNISH CORPORATION

Roanoke, Virginia



...does have a finishing ...plement our technical ...ills help ...

BUY BONDS